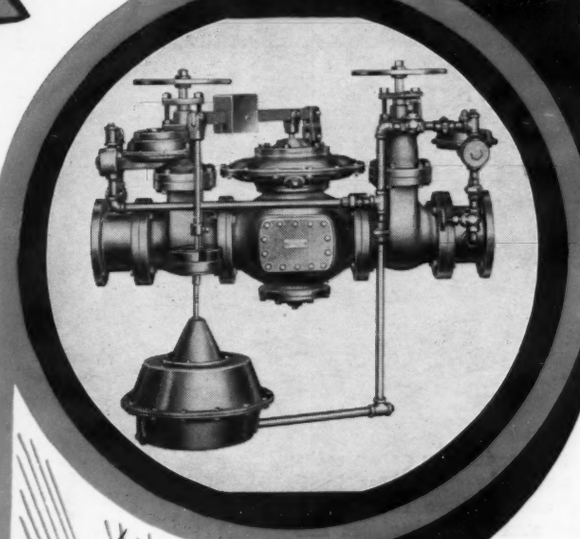
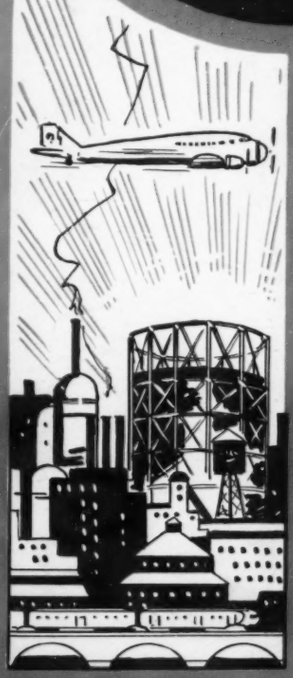
GAS

FORMERLY WESTERN GAS

ENGINEERING • UTILIZATION • LOAD-BUILDING • MANAGEMENT





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REYNOLDS District Station Regulators, manufactured in single and double district types, give satisfactory limits of control throughout a wide range of operating conditions.

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Reynolds Gas Regulator Company ★ ANDERSON, INDIANA, U.S.A.

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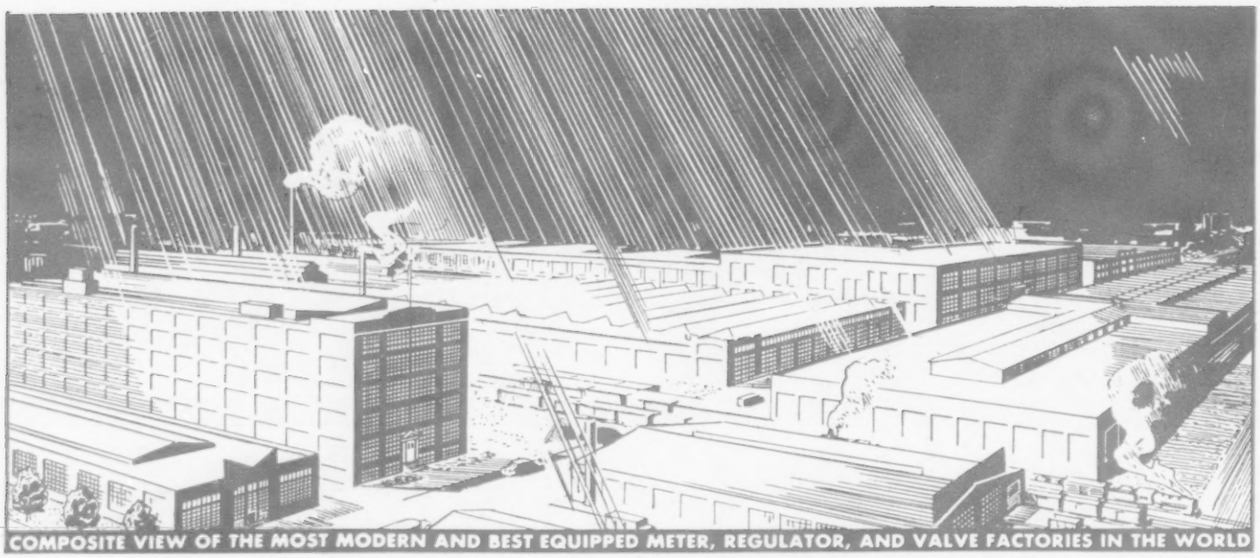

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PROUD TO SERVE A GREAT INDUSTRY

The confidence placed by the Gas Industry in our organization, since its founding half a century ago, not only makes us justly proud but also impels the safeguarding of a valued reputation. The constant adherence to a rigid set of business principles has been largely responsible for our success.

We feel that the continued support of the Industry can be merited only by the consistent maintenance of the

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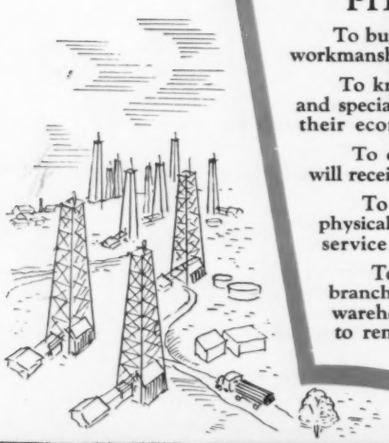
To build EMCO products up to a high standard of quality in design, workmanship and materials, rather than down to a price.

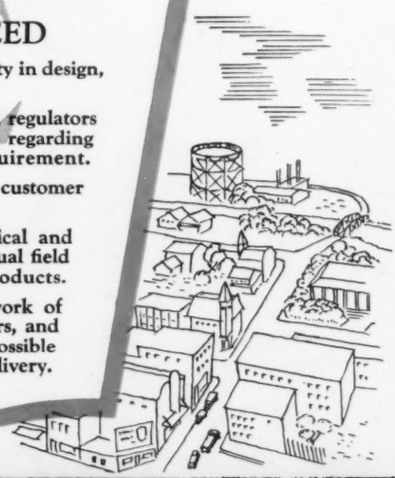
To know the limitations and capabilities of our meters, regulators and specialties, and to make frank, honest recommendation regarding their economic and physical suitability for a given requirement.

To enter into every transaction in the spirit that the customer will receive full value for his investment.

To continue research and experiment in our chemical and physical laboratories, engineering departments and in actual field service toward furthering the perfection of EMCO products.

To maintain a distribution system through a network of branch offices with a personnel of trained sales engineers, and warehouses carrying complete stocks that will make it possible to render more efficient service and assure prompt delivery.





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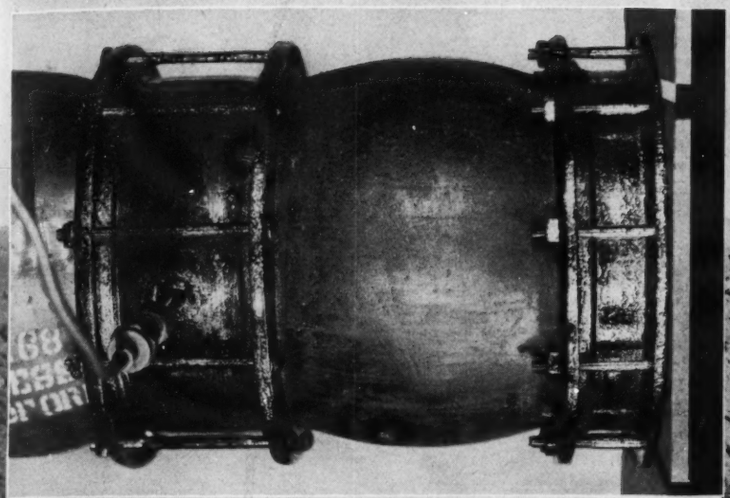

This 18" Dresser Coupling, tested at a working pressure of 1600 pounds per square inch, remained absolutely tight even though the pipe bulged, thus proving that its design more than met requirements. (Below). On the great 24" Chicago line (approximately 1000 miles long), Dresser Couplings were made with a positive *predetermined* strength sufficient to withstand a similar test pressure of 1600 pounds per square inch.

Predetermined STRENGTH

How strong do you want your pipe joints? Whatever your requirement, there is a Dresser Coupling to meet it—with a strength scientifically *predetermined.* That's because Dressers are assembled from standardized, precision-made parts . . . the strength of which can be varied to meet different working pressures! Guesswork is thereby eliminated . . . joint strength becomes a matter of mathematical formula.

Strength is only one feature of Dresser Couplings. Folder No. 355 describes others. Ask for it by number.

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GAS

FORMERLY WESTERN GAS

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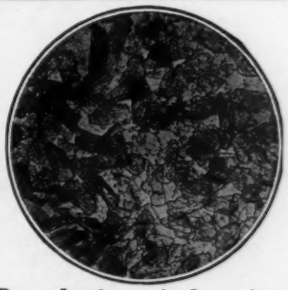
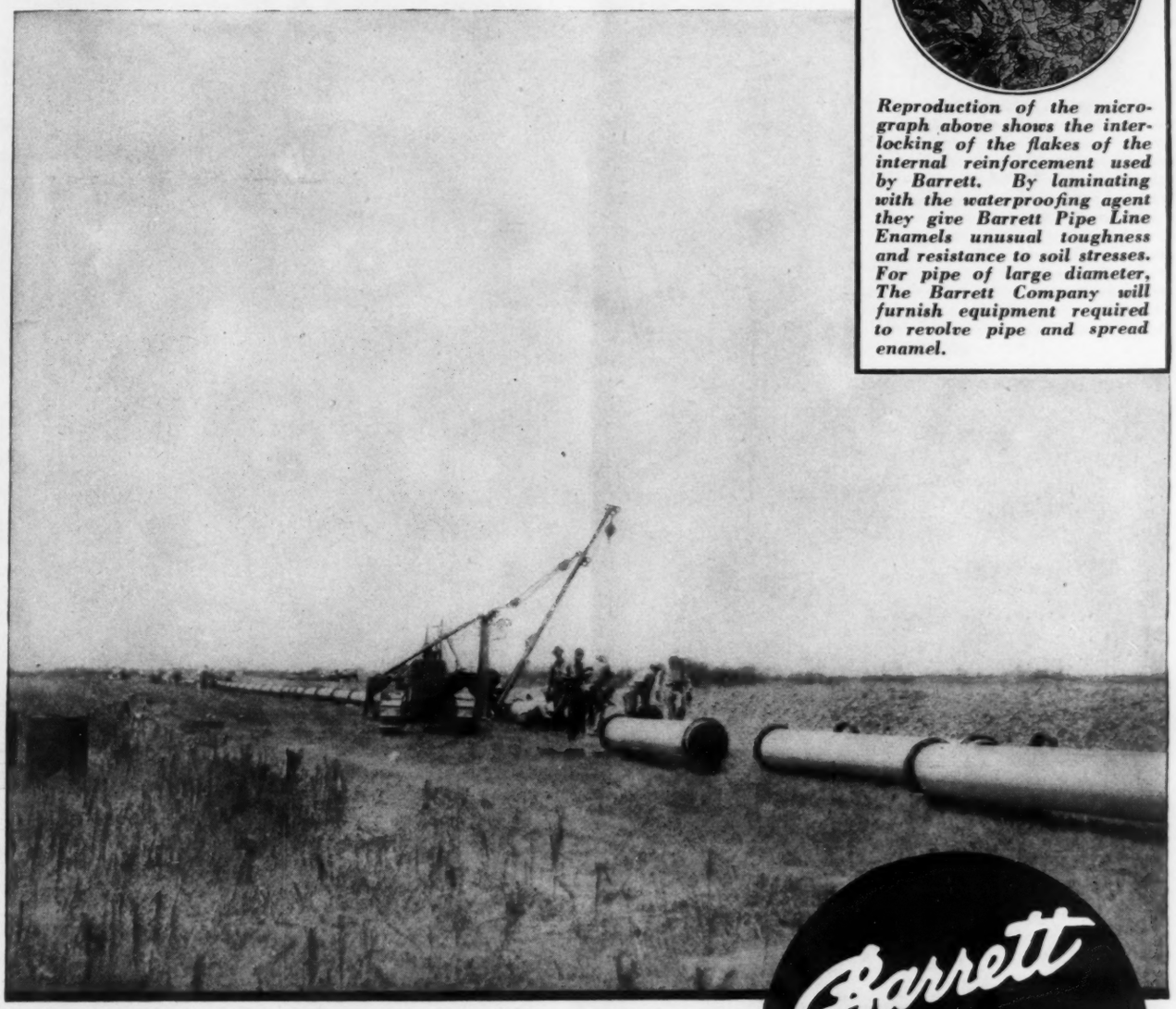
MEMBER: Audit Bureau of Circulations; Associated Business Papers, Inc.

Tough ... adhesive ... dielectric ... resistant to soil stresses



Reproduction of the micrograph above shows the interlocking of the flakes of the internal reinforcement used by Barrett. By laminating with the waterproofing agent they give Barrett Pipe Line Enamels unusual toughness and resistance to soil stresses. For pipe of large diameter, The Barrett Company will furnish equipment required to revolve pipe and spread enamel.



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PIPE LINE ENAMELS

Barrett Pipe Line Enamels are the result of 82 years of unmatched experience in waterproofing underground and underwater structures. They are produced from specially refined coal-tar pitch—the most stable waterproofing agent known—with a unique, non-porous dielectric flake type filler. Experience has shown that they are tough, adhesive, water-resistant, dielectric and impervious to oxidation or deterioration under ground or under water . . . provide lastingly effective protection against corrosion.

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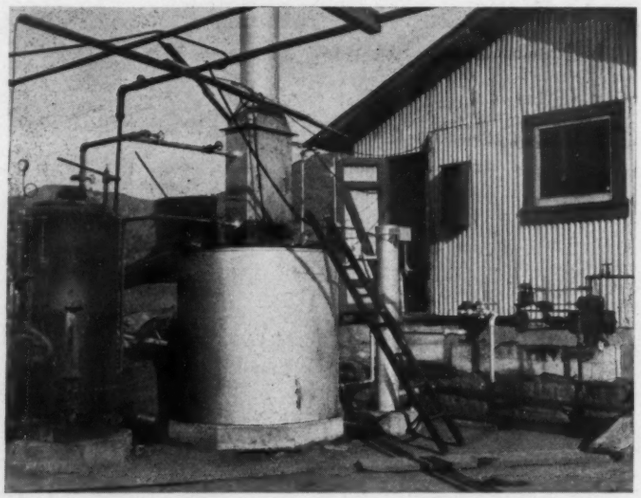
Carefully trained Barrett field men will gladly work with you, combining their special knowledge and experience with your familiarity with conditions along the right of way.

Gas Pipeline Dehydration Systems

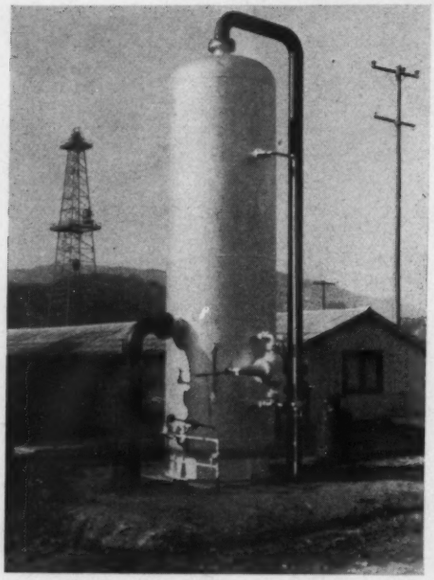


Any Volume

Any Pressure

Any Dew-point

Full Automatic Control



Calcium Chloride Dehydration Unit
Southern California Gas Co.
Ventura, Calif.

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Cutbank, Montana
Calcium Chloride Cycle
with Atmospheric Cooling Only—Cap. 30 MM.

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Huntington Beach, Calif.
Glycerine Cycle
No Cooling—Cap. 30 MM.

PLANTS UNDER CONSTRUCTION

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Liberal, Kansas
Calcium Chloride Cycle
with Atmospheric and Refrigerative Cooling
Cap. 200 MM.

NORTHERN NATURAL GAS CO.
Two Diethylene Glycol Cycle Units—No Cooling
Hugoton, Kansas—Cap. 50 MM.
Skellytown, Texas—Cap. 100 MM.

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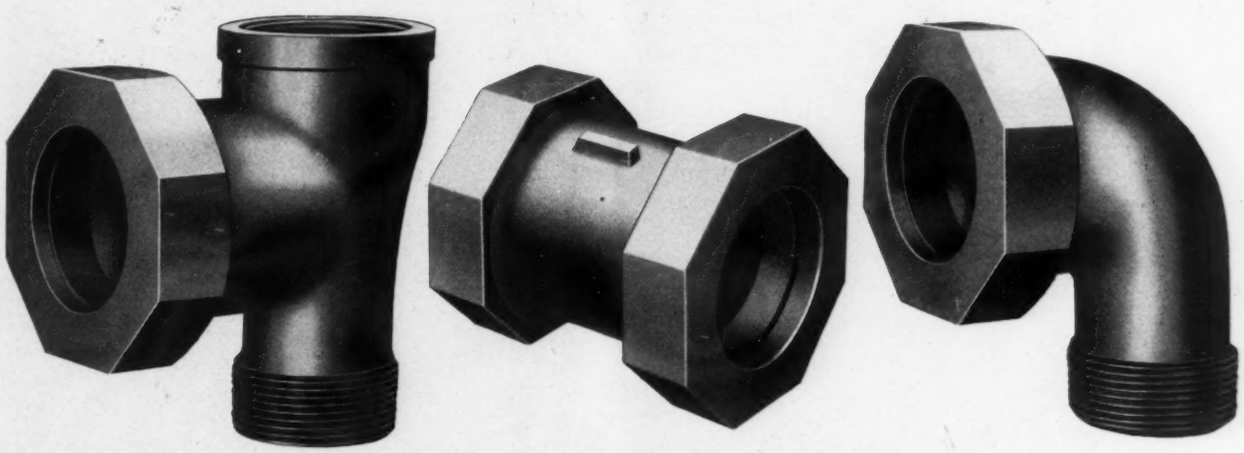
An Exhibit OF NEWLY DEVELOPED DAYTON *Service* FITTINGS

BOOTH 228
A. G. A. CONVENTION
ATLANTIC CITY
OCT. 26-30

. . . will be a feature of the display of the complete line of Dayton Pipe Line Requirements.



THE NATIONAL SUPERIOR CO.
DAYTON PIPE COUPLING DIVISION DAYTON · OHIO

Why Heaters CLICK *with* KLIXON All Gas Control

HEATERS with built-in Klixon Gas Actuated Thermostats sell faster. For these thermostats make heaters safe and automatic—provide the accurate snap-acting control that pleases customers—control that insures even, healthful heat at all times.

Furthermore, Klixon thermostats provide the type of control that gas companies want to sell—an **all-gas** control that they can service with their own organization.

Klixon Thermostats are low in cost and simple in operation. They can be used for remote temperature control, integral control and pilot safety control on practically any unit.

Klixon manufactures **the only complete line of all-gas thermostats.** A full line of Klixon electric thermostats for gas heaters are also available.

Send for bulletin.

KLIXON

TRADE MARK REG. U.S. PAT. OFF.

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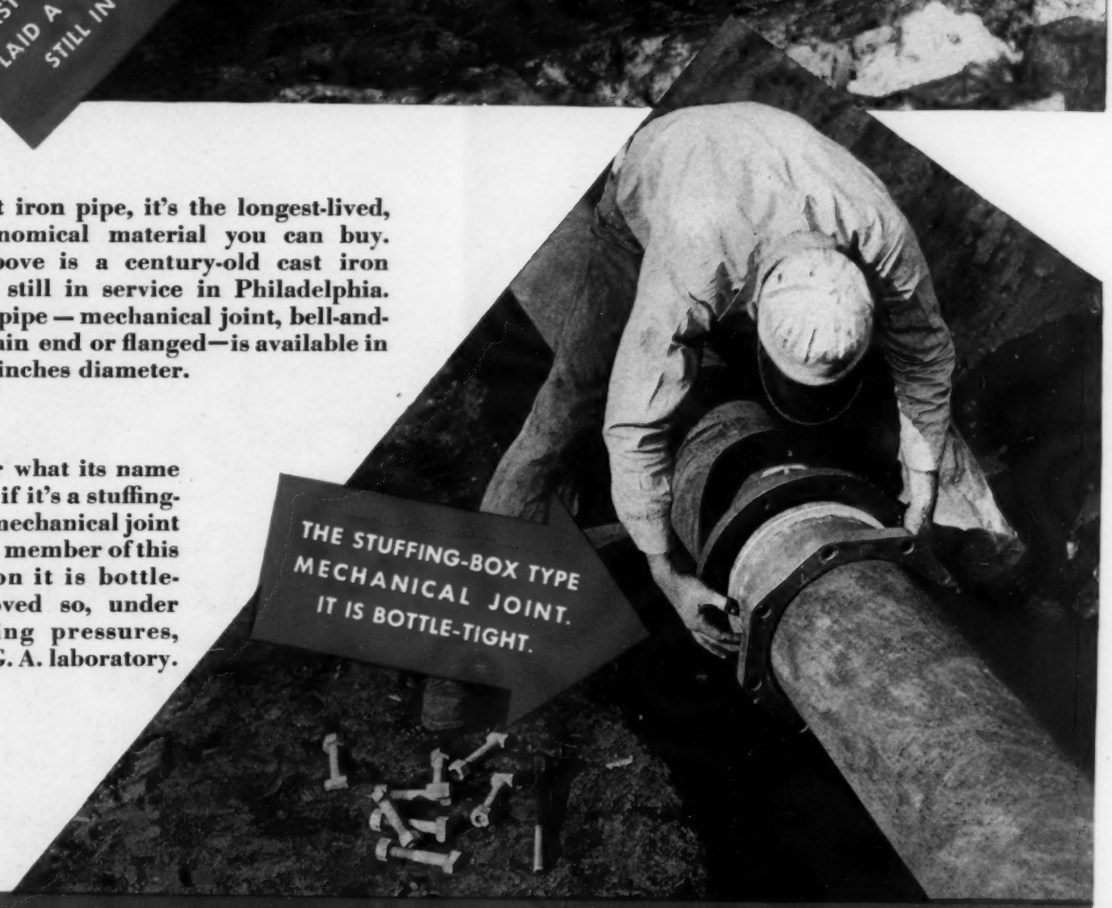
If it's cast iron pipe, it's the longest-lived, most economical material you can buy. Shown above is a century-old cast iron gas main still in service in Philadelphia. Cast iron pipe — mechanical joint, bell-and-spigot, plain end or flanged—is available in 1¼ to 84 inches diameter.

No matter what its name or design, if it's a stuffing-box type mechanical joint made by a member of this Association it is bottle-tight. Proved so, under all working pressures, by the A. G. A. laboratory.



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The Cast Iron Pipe Research Ass'n, Thos. F. Wolfe, Research Engineer, 1013 Peoples Gas Bldg., Chicago

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★ for stopping leaks in pipe lines — instantly, permanently! The standard clamp of the industry for 40 years. Write for complete Skinner catalog.

M. B. SKINNER CO. *Est. 1898* **SOUTH BEND, IND.**

GAS
October, 1936

Guest Editorial

MODERN IS AS MODERN DOES

By J. V. STRANGE

Vice-president, United Gas Public Service Company

THE word "modern" is a much overworked word. Webster says it means, "of, or characteristic of, present or recent times." But the present competitive situation between electric and gas services cannot be determined on the basis of which of these services is the newer or more characteristic of recent times. Consequently, it seems worth while to give thought to the real significance of the statement, "Modernize Your Home With Gas."

Electricity for cooking and water heating service became a competitor of gas service about twenty years ago. As time went on, electric ranges and water heaters were much improved from a mechanical standpoint, while gas appliances marked time, apparently smug in the belief that there was nothing to worry about. Now we find that electric service is an active competitor, threatening at points in the household where the gas industry must maintain its position if it is to survive in the domestic field. Even in competition with cheap natural gas we find the electric industry making slow, but, nevertheless fairly steady progress in its efforts to usurp a field which is indeed the very backbone of support to the gas industry.

We have seen enough in other fields to convince us that the public is willing to pay more for a service when convinced of its merits. Hence, it is evident that we cannot rely on the fact that our service costs less than another service. Economy is a good word, and in the days of Benjamin Franklin it was a virtue, but in this day and time it is not only, in the estimation of many, a "forgotten" word in governmental affairs, but it certainly has lost its appeal in matters concerning the family budget when something that is thought to be more modern is presented.

The gas appliance industry finally realized the necessity of providing appliances with which the same claim of modernity could be made that for too long a time had been so successfully claimed by electric appliance manufacturers. For example, gas ranges of today are insulated, they are automatic, and they have eye-appeal on a plane fully comparable with electric ranges. From the standpoint of the appliances themselves, it must be admitted that they are equally "characteristic of modern times." This being true, from the standpoint of Webster's definition, they are equally "modern." But it seems that the real test from a competitive standpoint must come from comparison as to the performance of the respective services. In other words, gas service must offer all that is offered by its competitors, plus the ever present advantage of being more economical.

The challenge in this situation seems to lie jointly at the doors of the manufacturers of gas appliances and the gas industry. While gas appliances have already been greatly improved, they must make steady progress in the future if they are to keep up with the procession. There are operations in the domestic field where gas could be used successfully if suitable appliances were available for such use. We need much more research work in the matter of developing gas appliances than we have had in the past. Utilities must realize that modernization of service methods and practices is essential if they are to do their part in meeting this competitive situation. Modern gas appliances require modern service methods on the part of the utilities. Service employees must be kept informed as to all recent developments on the part of appliance manufacturers.

(Continued on Page 73)

This Research **behind**
accurate meter performance

IN THE ALBANY RESEARCH LABORATORY of American Meter Company some fifty projects have been under way during the past four years alone . . . all relating specifically to improving the construction and efficiency of Tinned Steelcase meters, when operating under the conditions encountered in present day gas industry practice.

Reports on findings are withheld until thoroughly tested for long periods . . . notwithstanding the temporary commercial advantage which might be gained from premature publicity.

Gas industry customers are invited to consult the laboratory on gas measuring problems.

AMERICAN METER CO. MEASUREMENT ENGINEERS CENTENNIAL 1836-1936

AMERICAN METER COMPANY
INCORPORATED
Measurement and control of Gas, Oil, Steam, Air and Liquids
PACIFIC METER WORKS • LOS ANGELES • SAN FRANCISCO

652

SEE AMERICAN METER COMPANY'S CENTENNIAL EXHIBIT
A. G. A. CONVENTION—BOOTHS 300-301-302 AND 303

October, 1936

GAS

TWELFTH YEAR OF PUBLICATION

Vol. XII, No. 10

LOS ANGELES—810 South Spring Street . . 1064 Peoples Gas Building—CHICAGO

Night Scene of Atlantic City's Municipal Auditorium, from the Boardwalk

A. G. A. PREPARES ANNUAL INVENTORY

OCTOBER 26-30 is annual inventory time for several thousand of the gas industry's personnel who have earmarked this five-day period for attendance at the A.G.A.'s 18th annual convention. Atlantic City's Municipal Auditorium with its peerless exhibit hall also will accommodate the first gas appliance and equipment showing to be staged under the auspices of the Association of Gas Appliance and Equipment Manufacturers.

Convention keynoters this year have more latitude for inspirational messages than for some time past, since 1936 has witnessed a number of constructive developments in the gas industry—notably the beginning of national advertising. Just a year ago at the 17th annual convention the industry committed itself to the national campaign, and brought it into being within a few short months of intensive effort—an accomplishment which will receive due attention at Atlantic City, particularly in respect to the industry's present opportunities in utilizing the campaign.

In addition to being prominently spotted on the general session program, national advertising will be the theme of a luncheon forum set up on Thursday.

Of considerable timeliness on the general sessions will be a review of the recently concluded World Power Conference in Washington. This convention assignment is in the capable hands of Walter C. Beckjord of Columbia Gas and Electric Corp., who presided over the all-gas meeting at the Power Conference.

Each of the several A.G.A. working sections has on tap a worthwhile program of specialized nature, and on top of this "regular fare" the convention has arranged some special offerings this year. For example, executives whose duties lie in the field of personnel management will share a luncheon conference for the first time, devoted to personnel work, and held under the auspices of the Committee on Personnel Practices.

In addition to two regular sessions of the Commercial Section a special short session will be devoted to awarding of prizes to company winners in the three sales contests conducted under the A.G.A. banner, on range, water heater, and refrigerator sales. Another special feature of the Commercial Section meetings will be the Tuesday opener, directed at executives in charge of utility development and sales programs. Long term financing, promotional rates, local tie-in with national advertising, and modern needs in gas appliance performance are some of the key subjects to be developed at this session. Other topics on the commercial men's agenda include plans and methods of hitting the new home market, and house heating progress during 1936.

For the Industrial Gas Section three meetings are arranged, plus a special luncheon. Sales methods and opportunities in the commercial field will merit preferred attention this year with the industrial men.

The usual full program is planned by Technical Section officers for their group. One subject which will draw unusual interest is that of "Radio Communication to Mobile Units for Normal and Emergency Dispatching in the Operation of Public Utilities."

On the afternoon of the opening day the Natural Gas Department, under the direction of Chairman William Moeller, Jr., will hold its final session of the year, and several papers which appear on the program are well calculated to reward the natural gas man for the trip to Atlantic City. Following is the Department's complete program, which will be run off at the Ambassador Hotel:

Monday, October 26, 10 A.M.

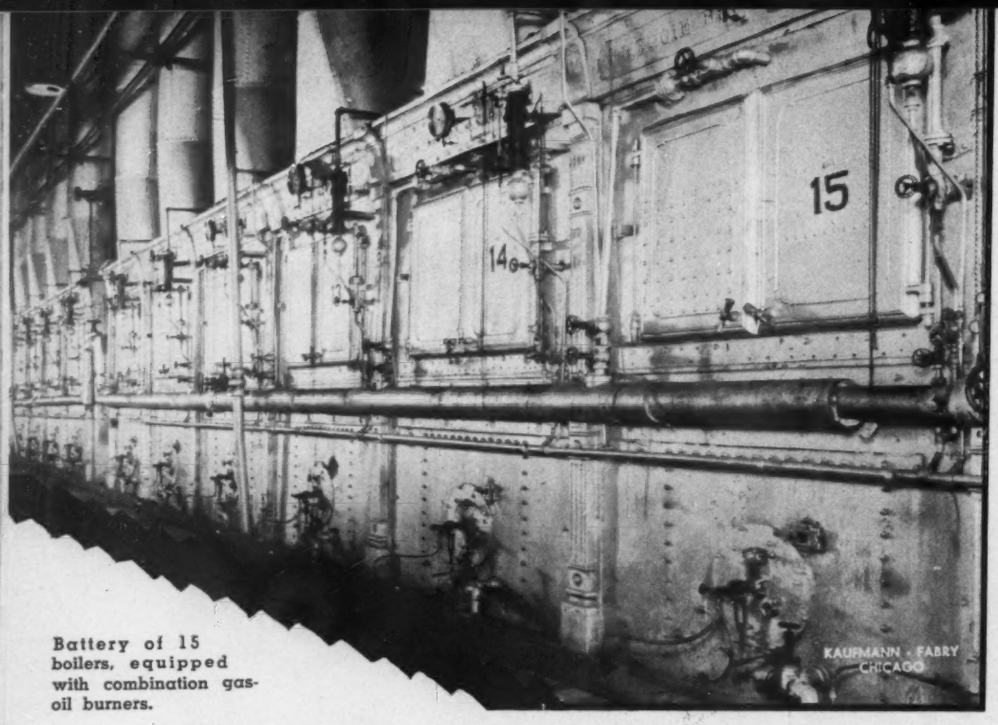
Main Technical & Research Committee Meeting, H. C. Cooper, Chairman. (Note: This meeting open to all Natural Gas Department members.)

2 P.M.

1. Opening remarks by the Chairman—(Wm. Moeller, Jr.)
2. Report of Main Technical & Research Committee—(H. C. Cooper, Chairman).
3. Paper: "Polymerization of Natural Gas"—Dr. J. S. Carey, M. W. Kellogg Co., Jersey City, N. J.
4. Paper: "The Trend of Natural Gas in Industry"—Frank H. Adams, General Manager, Surface Combustion Corp., Toledo, Ohio.
5. Paper: "Improving Capacity of Large Transmission Pipeline by Internal Cleaning with Pipeline Scraper"—F. J. Trelease, Ford, Bacon & Davis, Inc., New York, N. Y.
6. Report of Nominating Committee and Election of Officers—(John B. Tonkin, Chairman).

6:30 P.M.

Annual Meeting and Dinner of the Executive, Managing & Advisory Committees, Natural Gas Department.



Battery of 15 boilers, equipped with combination gas-oil burners.

CHICAGO

By S. LANGE

Industrial Engineer, The Peoples Gas Light and Coke Company

THE introduction of natural gas in the Chicago area—the increase in the house heating load and the resultant peaks, made it necessary to find large volume interruptible business. The metallurgical and steam generation loads in the steel industry presented the best possible potential customer for the immediate sale of gas at rates advantageous to the gas company, and economical to the steel manufacturer.

One typical plant in Chicago manufactures, in addition to standard steels, special alloys in the form of ingots, billets, bars, special strips and rods. The total tonnage produced per year approximates 180,000 tons, and during the peak years has mounted as high as 400,000 tons. Involved in the production of steel are steam boilers, open hearth furnaces, soaking pits, re-heat furnaces, and the equipment used for rolling various sizes and shapes, consisting of the blooming mill, 21-inch, 12-inch and 10-inch mills. This plant has equipment for the production of 30- to 40-ton single ingots for use in forging large pieces of special machinery, and a corps of metallurgists and chemists is maintained; firstly, to provide a rigid inspection on the work in progress, and secondly, to do research work in order to keep developing processes in steel manufacturing, to insure the best quality possible in meeting the customer's exacting requirements.

Here was offered a very unusual opportunity to demonstrate the advantage of natural gas as a metallurgical fuel. In working out the engineering problem of introducing natural gas the engineering and installation operations were carried on by the steel company and furnace manufacturers, in consultation with the gas company engineers.

Boiler House: Fifteen horizontal return tubular boilers, each rated at 140 horsepower, which were hand-fired and operated at 150 pounds steam pressure under forced and natural draft, were equipped with oil-gas burners of the nozzle mixing type. Air at a pressure of .6 inch, and gas at a pressure of 7 pounds per square inch were provided for gas operation. When oil-fired, steam at 100 pounds per square inch is used for atomization, and air at .6 of an inch pressure for combustion. The burners have a maximum capacity of 125,000,000 B.t.u. per hour.

The controls in use for the boilers have proven to be very simple and quite reliable. A master regulator which is actuated by a variation in steam pressure, automatically causes a change in the settings of the intake louvers on the fan, simultaneously causing the butterfly valve in the main gas header to be automatically set to the proper position for maintaining a predetermined air-gas ratio. The controls used on the boilers and furnaces are of the regulator type, employing the "jet-pipe" principle. A rotary meter is used for registering the amount of gas used in the boilers, in addition, a flow meter, both indicating and recording, is in use to measure the amount of water evaporated. The change from coal to gas has been economical and highly satisfactory, for in addition to the cleanliness, the flexibility of handling such a variation in demand, (40,000 to 110,000 pounds of steam per hour) is of great importance. This has been accomplished with a substantial reduction in maintenance cost.

Open Hearth Furnaces: There are eight basic open hearth furnaces in this plant, four 75-ton, and four 100 ton, formerly fired with oil fuel. The furnaces are of the conventional design, with a hearth approximately 15 feet wide and 30 feet long. Each furnace has its own stack and between the stack and checkers, are the air intake valves and dampers. The furnaces are fired first from one end and then the other, the reversals being 15 minutes apart.

In changing to natural gas, some oil was retained to insure luminosity of the flame. A burner developed at this plant is being used for delivering approximately 75 per cent gas and 25 per cent oil, by B.t.u., the amounts of each being adjustable. Leaving the burner, about 3 feet back of the port opening, there is a mixture of steam, oil and natural gas, which is discharged into a flow of preheated air. With this arrangement, it has been possible to drive the heat through the metal bath in order to work out the slag so it can be drawn off. Each furnace is equipped with a gas pressure regulator, furnace pressure regulator, indicator for hourly gas flow, recording gas flow meter and draft gauge, and cold charges of approximately 100 tons each are melted and brought to a temperature of 2,900° F. in from 12 to 13 hours.

Soaking Pits: Seven batteries of four hole pits each were formerly fired with producer gas, and were rebuilt for natural gas firing.

The change to natural gas was made by opening the central port in the gas reversing valve to the atmosphere so that now the combustion air is supplied through two reversing valves and all the checkers. A manifold was installed on two opposite sides, adjacent to the checker chambers and each manifold equipped with two 1½-inch open pipe burners delivering gas at pound pressure. The gas flows from the burners into a chamber approximately 1 foot wide, 6 feet long, and 3 feet high, entering the pit about 1 foot above the hearth floor, while air is drawn up through the checkers, entering the pit just over the gas. The flue products are drawn through the checkers on the opposite side, and vented through the stack. The gas burners are piped so that the control and reversing valves, together with the mechanisms for operating the dampers for the checkers and the air reversing valves are all on a raised platform to one side of the soaking pits, so that the furnace operators can make whatever changes are necessary to obtain the desired results. A weighted regulator is used for maintaining uniform pressure to the burners, and a recording flow

STEEL PLANT FINDS IDEAL FUEL IN NATURAL GAS

meter is used for measuring the gas consumption. In addition, each battery of pits is provided with an indicator showing the hourly gas flow. An automatic regulator is in use for maintaining a predetermined suction on the stack between the reversing valves and the main stack damper. The maximum hour gas demand for all the pits is 100,000 cubic feet (1,050 B.t.u.) Ingots are heated on an average of 2¼ million B.t.u. per ton. Natural gas has proven entirely satisfactory for the soaking pits, and in addition to the economy, there is uniformity of supply and the elimination of the producers and their constant check up.

12-inch Mill: This mill is for rolling from 7¾ x 7¾-inch to 4 x 4-inch billets, 10 to 15 feet long, into 4½-inch round, and down to ⅝-inch round or square, in addition to spring steel and square edge and round edge flats and special sections to fill jobbing orders. These billets were previously rolled in the blooming mill and are kept in stock for filling orders. Two gas furnaces with combination gas-oil burners were installed for heating this material. They are 54 feet long, 18 feet wide, and 5 feet high, pusher type, being loaded at the back and discharged at the front, and are designed to hold 100 tons of steel, with a capacity of 40 tons per hour. About 15 feet of the hearth at the discharge end is for soaking. The furnace is equipped with water cooled skid pipes, and it is triple fired, that is, there are 3 sets of 6 burners each, all at the front end. The top set fires over the billets, the lower set mounted directly below the top set, fires under and against the billets, while the center set of burners, mounted about 15 feet ahead of the others, toward the discharge end, fires against the billets while in the soaking zone. The capacity of the upper and lower is 6,000 cubic feet each of natural gas per hour, and the center burners, 2,000 cubic feet each per hour. The burners are of the diffusion, long flame type, and consist mainly of a cylindrical outside casting, larger in diameter at the back end, and flanged for mounting at the front or discharge end, and four telescoping sleeves, the largest being at the discharge end. By removing the plug in the tee of the gas line at the burner, an oil burner is introduced for converting to oil fuel when gas is interrupted. Each furnace is provided with stacks and flue dampers, which are automatically operated to maintain a predetermined furnace pressure for the prevention of infiltrated air. In addition, the furnaces are equipped with automatic gas pressure control, automatic control for maintaining a predetermined air-gas ratio, gas set manually; air follows gas flow. There is one recording flow meter for both furnaces and an indicator showing hourly rate of gas flow on each. The results obtained have been very satisfactory. The maximum gas hour demand for both furnaces is 120,000 cubic feet (1,050 B.t.u.) of natural gas. The heating time through the furnace for a 7¾-inch billet is 3 hours, requiring an average of 3 million B.t.u. per ton.

10-inch Mill: This mill is used for rolling bar stock and rod. The billets are 30 feet long and 3 inches, or 2⅛ inches square, and are heated in a furnace 30 feet wide, 40 feet long, and 4 feet high, constructed with an inclined hearth and a double roof. It is provided with a refractory recuperator and a stack. Air for combustion is furnished by a low pressure blower. Control of the flame was accomplished by adjusting the gas and air ports, and varying the speed of the fan, all operations being manual, and dependent on the furnace operator.

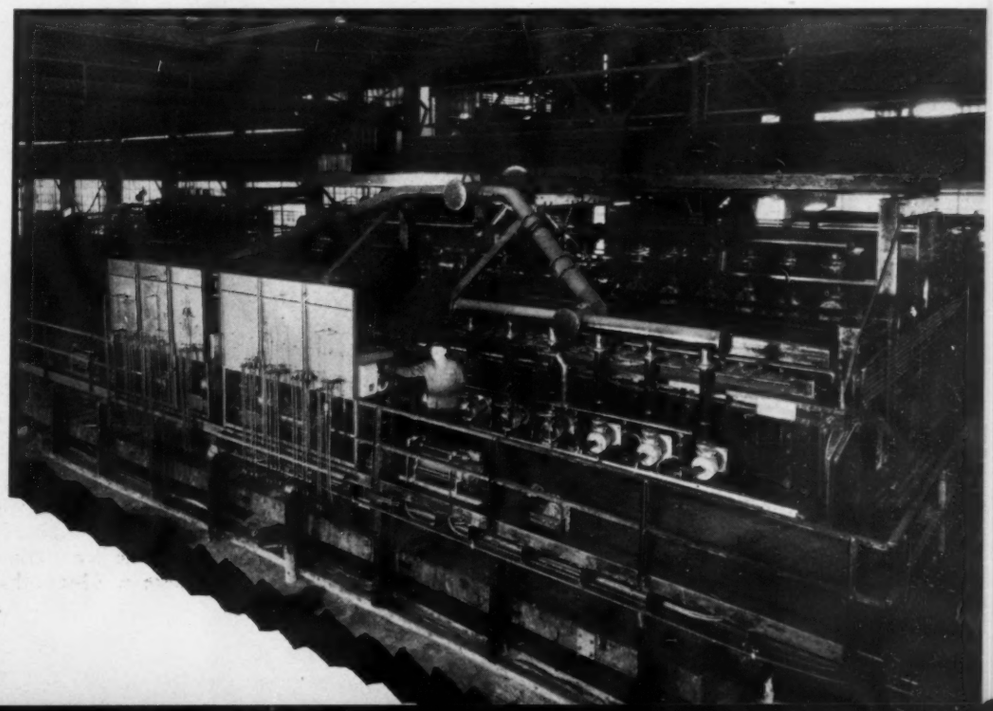
The change to natural gas was made by blocking off the producer gas ports and installing twelve 1½-inch open pipe burners at right angles to the air flow. Oil is used for a stand-by fuel and the change is made by removing a plug in the tee at the gas burner, and inserting the oil burner using steam for atomizing. The maximum hour gas demand is 40,000 cubic feet (1,050 B.t.u.) of natural gas requiring approximately 2 million B.t.u. per ton.

This furnace is automatically controlled for furnace pressure to prevent infiltration of air, automatically controlled for maintaining gas volume flow, and for correct air-gas ratio, through the utilization of recording and indicating instruments designed on the jet-type principle.

Smaller Heating Units: In addition to the furnaces described in the foregoing, there are forging furnaces converted from oil to gas and heat treating furnaces converted from electricity to gas. The forge furnaces are for both production work (spike forming) and job forgings. Several small units have been constructed at the plant for forming chisels under Bradly Hammer and for hardening in a lead pot. High pressure gas inspirating type burners are being used for all these furnaces with various pressures, depending on the pres-

(Continued on Page 38)

● Showing 12-inch reheat furnaces. Upper row of burners (furnace on right) fire the top zone. Lower row fires into soaking zone. Panels and piping shown on left are for control devices.



BASE THE

By BERT W. REYNOLDS

Manager, Dealer Sales Promotion
Pacific Gas and Electric Company*

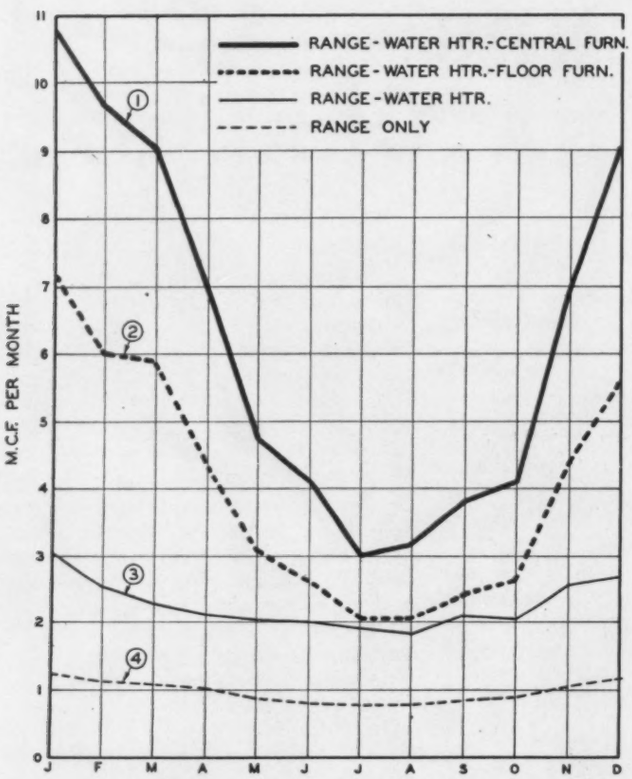


FIG. 1:
CAPACITY AND ANNUAL USAGE
Central Fur.: 45 Mcf. (74,000 B. t. u.)
Floor Fur.: 23 Mcf. (30,000 B. t. u.)
Water Htr.: 15 Mcf.
Range: 12 Mcf.

SOME three years ago the Pacific Gas and Electric Co. established a Promotional Sales Research Bureau within the Sales Department to study and analyze such factual information as we had, and to recommend means for securing other information which we needed. We have not reached a high degree of perfection, but our progress is encouraging and we feel confident that our thinking is decidedly in the right direction. Our efforts along this line have caused us to regard most highly the value of factual information.

We are in no way attempting to suggest either the means by which facts should be secured or the method in which they should be used. We are merely saying that in these days they are invaluable to every utility in guiding its sales program and we shall mention some questions as examples in support of our views.

Here is a question which begins to be of interest to any company as peak demands approach production and/or distribution capacity to a point where capital additions are in the offing; and especially is this true in this present era to which we have referred. *What types of appliances will, if sold, produce desirable revenue? Relatively speaking, which utilization process is the most profitable—cooking, water heating, or space heating?* (In the aggregate there is a very small usage of gas for lighting, air conditioning, and refrigeration in P. G. and E. territory of service; and it has not been segregated in this discussion.)

A solution to this question requires that it be broken down into three other questions.

1. What is the average amount of gas each home will consume for each utilization process each month during the year?

2. Of the total annual domestic gas sales, how much is now being used for each process?

3. What is the average rate paid for the gas used in each process?

Probably the only way to get a completely satisfactory answer to question one is to set a large number of submeters on appliances that are in actual operation in homes, carefully apportioned among all sizes of homes throughout the area being served. We are considering doing this but in the meantime have gone about getting an approximate answer in another manner.

A list was prepared of all consumers around the bay area (who had been using gas for cooking and water heating only) that purchased gas heating equipment from either the company or principal heating dealers during the entire month of November, 1934.

A 24-months'. statement of the account of each of these customers was next secured, showing the 12-months' record of usage prior to the installation of the heating appliance and the 12-months' record following the installation of the appliance. Where a 24-months' record was not available, the customer was eliminated from the study. A summary of the information obtained is shown in Fig. 1. Line 3 shows the average consumption by months of all the selected customers prior to the installation of their heating equipment. Line 2 represents the monthly usage after installation of the customer who bought floor furnaces, and line 1 the usage after installation of the customers who bought central furnaces. Thus we have shown, the average usage by months for: A range, water heater, and central furnace by Line 1. A range, water heater, and floor furnace by Line 2. A range and water heater by Line 3.

B. W. REYNOLDS

To split range and water heater usage we studied the statements of a large number of apartments where the billing was exclusively for cooking—the heat and hot water being supplied from a central plant. We added 100 cubic feet per month to the average range usage in apartments to establish line 4, which is the average range usage by months in residences.

The average *annual* consumption for each appliance as determined from this study and the average size of the heating appliances determined from the sales contracts which were analyzed in connection with it, are also tabulated at the bottom of Fig. 1.

The data as determined above were tied in with information secured by means of our domestic survey to answer the second subquestion; namely, "Of the total domestic gas sales, how much is being used for each process?"

The top curve of Fig. 2 represents our total domestic gas sales during each month of 1935.

The section marked apartment cooking is the number of apartment ranges in use multiplied by the average usage of such a range month-by-month during the year.

*Presented at the Pacific Coast Gas Association annual convention, San Francisco, August 27, 1936.

SALES PROGRAM UPON FACTS!

The residential cooking section and the water heating section is the number of ranges and water heaters in use in residences as shown by the domestic survey, multiplied by their respective average usages for each month as shown on Fig. 1.

The heating section is the difference between the total domestic sales and the sum of the cooking and water heating consumption.

The spread of domestic sales during the year is shown on the chart in cu.ft. and in percentage of total sales by the three utilization processes.

Of course the uniformity of the cooking and water heating load throughout the year and the relatively high peak of the heating load during the winter months are of important significance; however, let's go on to our third subquestion:

"What is the average rate paid for the gas used in each process?" On Fig. 3 we have plotted the *volume of gas sold* annually in each process as determined from the preceding chart. Then we have charted the *annual revenue received* for the gas used in each process, taking into consideration the month by month usage and the various rate schedules and blocks thereof that would apply. In order to do this, it was necessary to assume that one service or the other would be used first, and while this may be as debatable as the question as to which came first, the chicken or the egg, nevertheless we have assumed that cooking would be used first, water heating second, and heating third.

Then by dividing revenue by consumption for each process, we obtained the average rate received for the gas used in that process, as charted, amounting to $1.45 per M c.f. for cooking, $0.78 for water heating, and $0.66 for space heating.

Study of these three subquestions has shown the seasonal load characteristics of each utilization process, together with the information shown on Table No. 1. *Cooking* accounts for 35 per cent of the domestic gas sold and 52 per cent of the revenue, water heating 35 per cent of the gas and 28 per cent of the revenue, and space heating 30 per cent of the gas and 20 per cent of the revenue. The average rate per M c.f. received from each process is: Cooking $1.45, water heating 78 cents, and space heating 66 cents. This is a composite of all rate schedules for the system that we are using here. Practical use of the data by the company is, of course, derived from a study of each rate schedule area.

Next in line is the question, *what are the market possibilities? Where, to whom, and in what volume can the appliances that will produce desirable revenue be sold?* In January of 1934, we inaugurated a plan for securing facts pertaining to this question. Information available on this subject was wholly inadequate. Surveys had been made from time to time but they were too often made by persons poorly qualified for such work, and furthermore the direct market information that was secured, soon became obsolete. What we needed was accurate facts, secured inside the home, by capable people and the information kept reasonably up to date. This involved personal contact in no less than 493 thousand homes, and it became apparent that *cost* would prohibit the information being secured, unless it was along with the performance of other essential work. Then, too, our customer relations must not be jeopardized in securing the information.

In the final analysis, it developed that the company's own sales force would be best qualified, and would afford the least

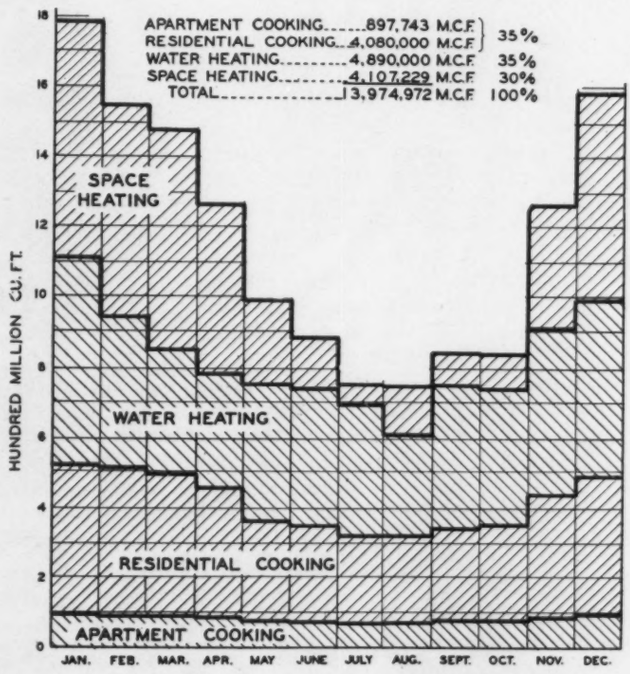


FIG. 2. Spread of 1935 Domestic Gas Sales.

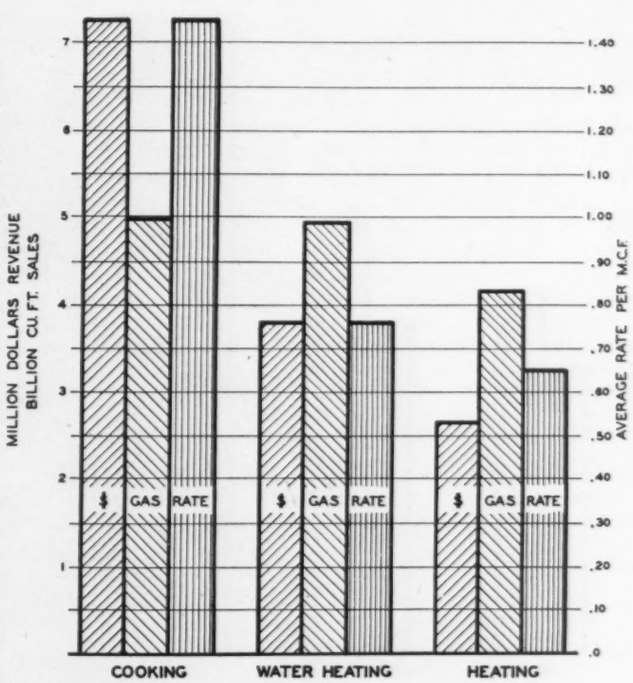


FIG. 3. Domestic Gas Sales—Revenue, Volume, Av. Rate.

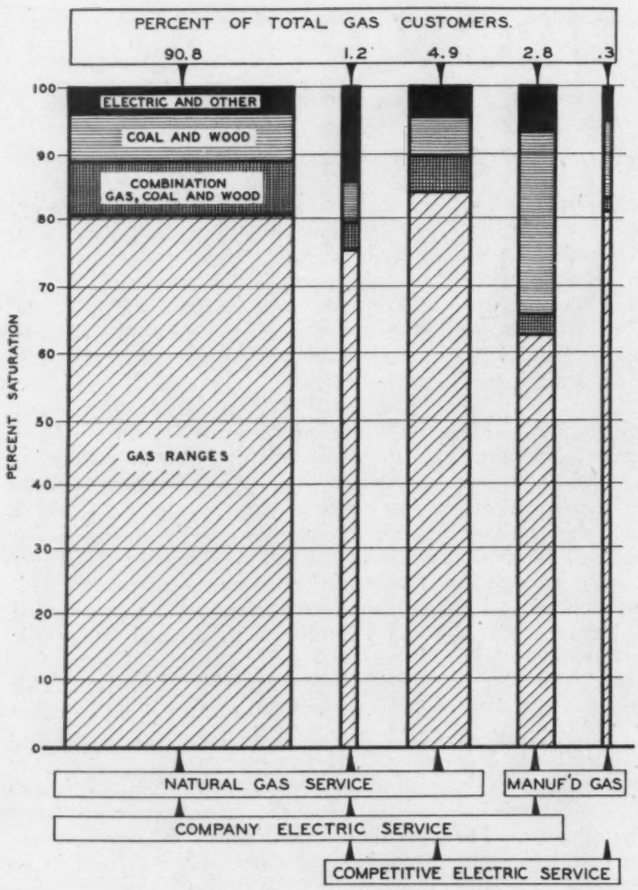


FIG. 4. Cooking Market—Types of service supplied.

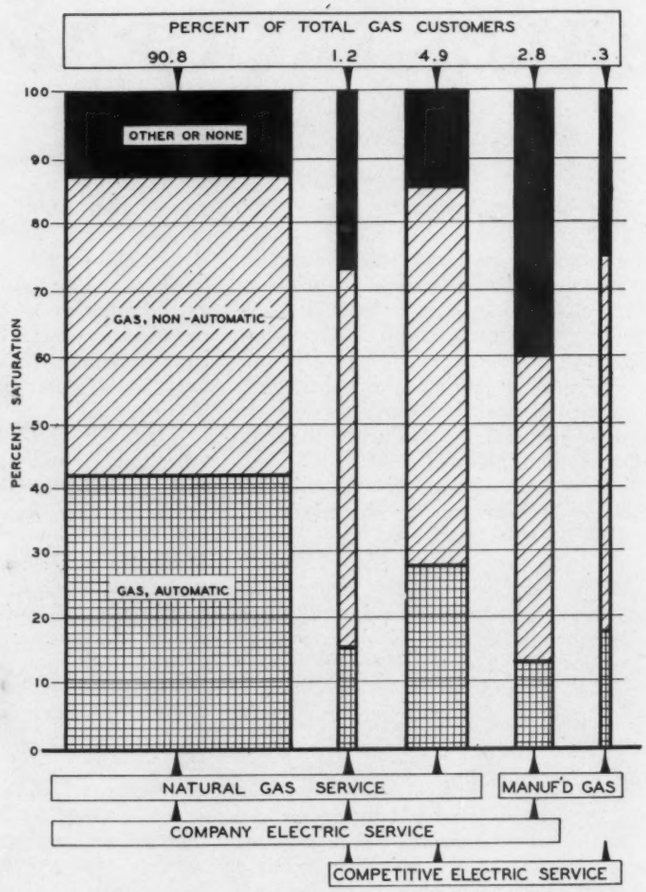


FIG. 5. Water Heating Market—Types of service supplied.

costly means of securing, from our customers, the information which was desired for sales planning purposes, and accordingly specific districts were laid out, and one salesman made responsible for each district. Each salesman was required to complete 20 survey interviews each week. This work has been carried on continuously since its inception, and is going right on. As soon as a survey is completed in each district, it is started over again so that the information is kept as nearly up to date as possible. At the first of this year, more than 213,000 domestic surveys had been completed, or approximately 56 per cent of the total residential gas customers served by the company. Each salesman, making the survey, is required to indicate on a standard 4- x 6-inch card, the following:

On the Front of the Card: The type of building being served, the type of service available to the customer, and the kinds of appliances or equipment installed for each utilization process. The symbols in the squares at the top of the card indicate the types of appliances that are in actual use in each home, together with their condition, and the symbols in the squares immediately under the appliances indicate the ones to be carded for intensive sales solicitation.

On the Back of the Card: Complaints and their immediate disposition are registered by the seven different classifications shown in the chart. If the salesman is unable to satisfy the customer, a special complaint tag is sent to the proper department for follow-up.

These survey cards are turned into the local office each day, where the procedure is as follows:

1. Prospect cards are made out for the appliances indicated and turned over to company or dealer salesmen for follow-up.
2. Special tabulations are made and sent each month to the Promotional Sales Research Bureau in the General Office for analysis.
3. Segregated lists are prepared for direct mailing.
4. The survey cards are filed by street and number for future reference.

A diligent pursuing of this process has developed an invaluable amount of factual information for use in market analysis. It gives an accurate picture of:

1. The potential market.
2. The need for our service.
3. The degree and kind of competition with which we are confronted.

(Continued on Page 54)

TABLE NO. 1

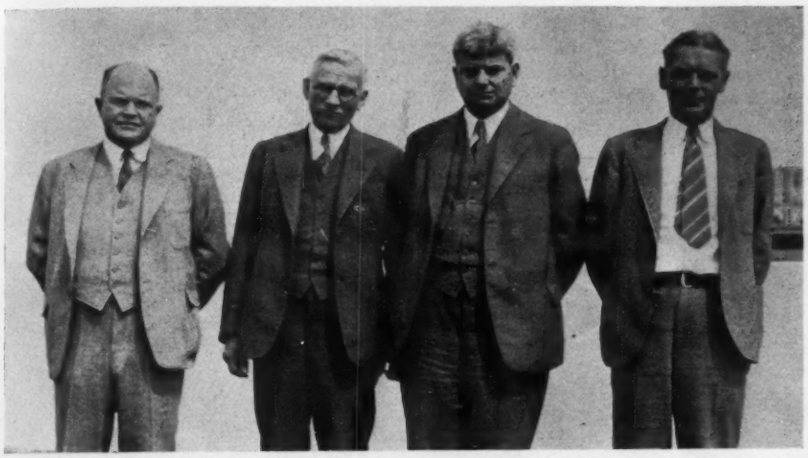
	Av. Size Sold 1000 B.t.u. Per. Hr.	Annual Spread Gas Usage 1000 M C.F.	%	Revenue* Million $	%	Av. Annual Usage Per Customer Actually Using	Rate* Per M C.F.
Cooking	....	4977	35	7.23	52	12 M C.F.	$1.45
Water Heating	....	4890	35	3.80	28	15 M C.F.	.78
Heating	....	4107	30	2.69	20	.....	.66
Floor Furnaces	30	.....	....	.....	....	23 M C.F.	.....
Central Furnaces	74	.....	....	.....	....	45 M C.F.	.....

*The revenues and rates shown are a composite of all rate schedules for the system.

CAMERA

GAS Camera welcomes photographs of all gas industry activities showing personalities at work and at play. Pictures should be clear, and poses, informal.

SCREENSTAR Mitzi Green smilingly puts the O. K. of a modern girl on a modern kitchen displayed at the Peoples Gas Light and Coke Co., Chicago.



FACING THE CAMERA are H. R. Peckham, general superintendent; W. F. Raber, president and general manager; L. M. Klauber, vice president in charge of operations; and E. D. Sherwin, assistant general superintendent, all of San Diego Consolidated Gas and Electric Co. Behind the camera was L. J. Willien, operating gas engineer, Byllesby Engineering and Management Corp. (now Public Utility Service Corp.), Chicago.

THROWING THE HEIFER right out of the picture are (left) Chester L. May, vice-president and general manager of Community Natural Gas Co. and Texas Cities Gas Co. and Roy C. Coffee of Dallas, general attorney for the Lone Star Gas Co.

SPEECH: At a Minneapolis Gas Light Co. sales breakfast are (left to right) Russell D. McCord, McCord Advertising Agency; W. G. Russell, field representative, GAS; the Minneapolis company's secretary, M. D. Read; vice-president and general manager, John K. Swanson; salesmanager, E. J. Boyer; and T. G. Kus, chief industrial engineer, Northern Natural Gas Co.

ON TOUR: Official government delegates and utility luminaries from all over the world were introduced to the American gas industry as the Third World Power Conference sponsored group tours to points of interest. The gas and coal group (Pre-Conference Tour No. 1) visited the American Gas Association Testing Laboratories in Cleveland last month.

House Heating Fundamentals... No. 5 in a Series

The SUPPLY

By B. A. JOHNSON

IN the previous four articles we have discussed the major items concerning house heating, namely, gas burning equipment, the control system, the heating plant and the distribution of heat. This discussion will be concerned primarily with the various factors of the gas and electric supply which have a considerable bearing on the success of the gas heating installation.

The supply of gas and electricity, as it applies to a gas heating installation, is too often taken for granted as something that will always take care of itself. In many instances when analyzing a problem that will come up on a particular heating installation, the gas and electric supply will be completely neglected. Some of the items covered in this discussion may seem trivial and insignificant; however, in the coordination of all factors of a job it is essential to consider them toward complete satisfaction.

CAUSES FOR GAS HOUSE HEATING COMPLAINTS DUE TO IMPROPER SUPPLY OF GAS.

Faults	Complaints
UP TO METER	
No gas in service. Stoppage in service. Service is too small. House regulator out of order (high pressure territory).	No gas or not enough, or not enough heat. Pilot goes out. Burner backfires. Excessive gas consumption.
Leak in service. Regulator seal broken (high pressure territory).	Odor of gas. Excessive gas consumption.
METER	
Meter sticking or binding. Meter too small.	No gas or not enough, or not enough heat. Pilot goes out. Burner backfires. Excessive gas consumption.
Leak in meter connections or casing.	Odor of gas. Excessive gas consumption.
FUEL RUN	
Fuel run trapped. Fuel run too small. Hand valve shut off or partially closed.	No gas or not enough, or not enough heat. Pilot goes out. Burner backfires. Excessive gas consumption.
Leak at valve or fittings. Piping cracked.	Odor of gas. Excessive gas consumption.
GAS PRESSURE REGULATOR	
Regulator too small. Regulator sticks closed. Vent on regulator restricted or plugged. Regulator installed backwards. Spring or weight off regulator. Regulator pressure set too low.	No gas or not enough, or not enough heat. Pilot goes out. Burner backfires. Excessive gas consumption.
Set too high—passing too much gas for burner or boiler capacity.	Floating flames.
Leak in diaphragm—causing gas to pass into vent line.	Odor of gas. Excessive gas consumption.
Chattering regulator caused by vent being too large.	Burner noisy.

Actually, the supplying of gas, from its source to the appliance of the customer, is a complex and sometimes difficult task. Yet, so successfully do most gas companies accomplish this task, that customers have come to accept a constant, unfailing supply as a matter of course. The transporting of gas from a remote plant or perhaps from a hole in the ground a thousand miles distant, through transmission pipe lines, compressor stations, distribution mains, and service piping, up to the user's appliance, is a feat which the customer now takes for granted.

Such an attitude on the part of the customer is a pre-requisite to the successful promotion of house heating business. The smallest suspicion in the mind of a prospective heating customer that a constant uniform supply of fuel would not always be on tap for his heating needs, might very easily remove that customer from the prospect classification. Furthermore, any actual interruption of the gas supply to present house heating customers is a most serious blow to the building of house heating load.

In the broadest sense, gas supply embraces all classifications of production and distribution facilities, from the source of supply to the appliances. However, this discussion will consider only the distribution from the service connection in the street to the customer's appliance in the order in which the various operations occur.

A. *The Street Service:* Usually of black steel pipe and malleable iron fittings, the street service carries the gas from the street main to the inside wall of the customer's premises. Generally a curb cock is included in the street service to permit of the shutting off of the supply at the street. The service should be buried below the normal frost level and pitched toward the main to allow any condensate to flow back to the street piping.

B. *The Service Regulator:* Because of the relatively high pressures carried in some distribution systems, it is often necessary to provide equipment for reducing gas pressure and at the same time insuring a constant pressure at the gas burning appliance. This is accomplished by the service regulator which

# of GAS and ELECTRICITY

Staff Engineer, Space Heating Division, The Peoples Gas Light and Coke Company

is nothing more than a spring or weight loaded diaphragm valve with a mercury or weight seal to protect the meter and appliances. The diaphragm is connected to a valve stem which shuts off the gas supply when the outlet pressure of the regulator becomes great enough to overcome the pressure of the spring and weight of the valve stem. When the outlet pressure is relieved, the valve opens and permits more gas to pass through the regulator. The outlet pressure may be varied by an adjusting screw at the top of the regulator which varies the amount of pressure required to close the valve.

C. *The Meter:* Several types of meters are available for measuring the amount of gas consumed on the customer's premises. Because of its accuracy, dependability, and low cost of maintenance the diaphragm displacement type of domestic meter is almost universally used. This meter consists of movable leather diaphragm compartments which are connected through a train of gears to hands revolving on the faces of dials which in turn indicate the amount of gas which has passed through the meter. It is possible to calibrate this type of meter to give extremely accurate measurement over long periods.

D. *The Fuel Run:* The fuel run may generally be defined as the building piping used to transport the gas from the meter to the appliance. In the case of space heating, it is generally considered good practice to have a separate and independent run with no take offs —other appliances being connected by a separate supply from the meter. It also is considered good practice to have the minimum size not less than 1 inch in diameter and, in most instances, a shut-off valve is installed at the end near the point where the fuel run is connected to the appliance (ahead of the gas pressure regulator).

E. *Pressure Regulator:* The gas pressure regulator for space heating usually is a standard piece of equipment furnished with the appliances (gas boiler, furnace or burner).

Practically all gas equipment manufacturers design their equipment to operate on gas pressure between 2½ and 3½ inches of water which, in most cases, is somewhat lower than the street service pressure. With a gas pressure regulator as standard equipment, the appliance can be adjusted to operate at all times at the pressure for which it was intended by the manufacturer. In other words, it assures the manufacturer that there will be a constant gas supply to his equipment, regardless of the locality or type of distribution system to

(Turn to Page 22)

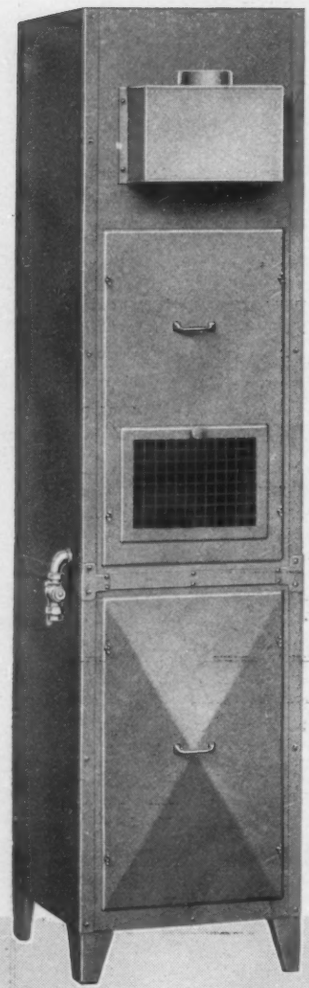
CAUSES FOR GAS HOUSE HEATING COMPLAINTS DUE TO IMPROPER SUPPLY OF ELECTRICITY.

Faults	Complaints
LINE VOLTAGE SIDE OF CONTROLS	
Interruption in Electric service — fuse blown, supply on an interruptable circuit; outage.	No gas or not enough, or not enough heat. Burner won't come on at proper temperature.
Interruption of electric service while burners are on, fuse blown, outage (series 20 only).	Burner won't shut off at proper temperature. Excessive gas consumption. Too much heat.
Corroded or loose connection.	Burner off and on. Burner won't come on at proper temperature.
Loose connection—causing rapid "on" and "off" operation.	Pilot goes out. Burner backfires. Burner noisy.
TRANSFORMER	
Open circuit in primary or secondary.	No gas or not enough, or not enough heat. Burner won't come on at proper temperature.
Loose or corroded connections.	Burner won't come on at proper temperature. Burners off and on.
Burned out transformer in series 20 circuit while burners are on.	Burner won't shut off at proper temperature. Too much heat. Excessive gas consumption.
Loose connection causing rapid "on" and "off" operation.	Pilot goes out. Burner backfires. Burner noisy.
Transformer too small, causing chattering solenoid valve on series 20 operation with diaphragm valve.	Burner backfires. Burner noisy.
LOW VOLTAGE WIRING	
Detached connection or wire pulled loose; corroded or improper connection. Loose or open connection in blue wire (series 20).	No gas or not enough, or not enough heat. Burner won't come on at proper temperature.
Short circuit or grounds. Loose or open connection in white wire (series 20).	Burner won't shut off at proper temperature. Too much heat. Excessive gas consumption.
Loose or corroded connection.	Burners off and on.
Red and blue wire shorted or reversed, causing "on" and "off" operation due to single contact operation of thermostat.	Burner backfires. Pilot goes out.
Loose connection causing rapid "on" and "off".	Burner backfires. Burner noisy.

Each a Leader

1

The Payne Line includes the most modern in Gas Heating and Air Conditioning Equipment.



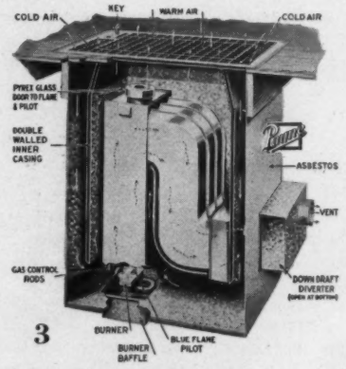
2

★ AS THE POPULARITY of gas heating increases Payne sets the pace in the development of new and better methods for heating and air conditioning with this most modern and ideal fuel. Payne appliances rank FIRST in . . .

DESIGN: The attractively designed and finished models in the Payne line have been produced with the utmost consideration for customer satisfaction. In striving for eye appeal we have sacrificed none of the features which have characterized Payne Products and helped us to build our present fine reputation in the gas heating industry.

QUALITY OF CONSTRUCTION: Twenty-three years' experience in the exclusive manufacture of gas burning appliances has resulted in the production of a line of appliances durable and dependable beyond question. The highest grade metals and materials in the hands of expertly trained workmen have produced equipment worthy to be included in any heating campaign.

EFFICIENCY: Payne appliances are thoroughly tested, first in our own modernly equipped laboratory, and then submitted for approval of the American Gas Association for efficiency, burner operation, construction, performance and safety. When offered to the trade, we can truthfully say their efficiency is in excess of the rigid requirements for these tests.



3

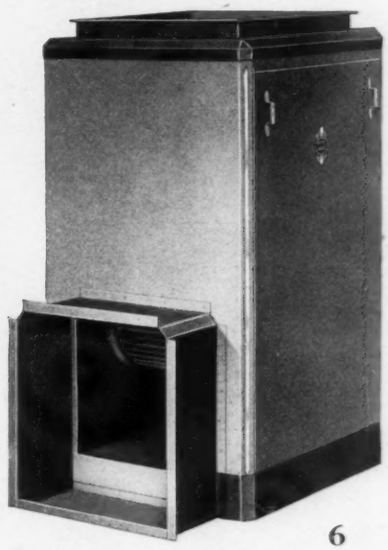
Payne

in its particular heating appliance field

First in Acceptance by Utility Merchandising Departments . . .

★ MORE GAS COMPANIES select Payne Products for their heating campaigns because they find in the Payne line a well designed appliance for every heating requirement. Whether the problem is single room heating or air conditioning an entire building, it can be accomplished better with Payne Gas-fired equipment. ALL Payne appliances are *gas-fired*. Each product has been created with the sole desire to broaden the scope of the gas heating industry and to increase the popularity of gas for heating.

There is a more selective load building range in Payne heating equipment than will be found in any other line of gas heating products.



6

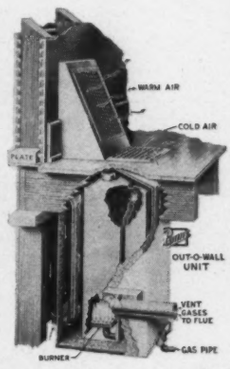
1. **Payne Modern Console Heater**
2. **"FAU" (Forced Air Unit) Furnace**
3. **Payne Floor Furnace**
4. **Payne Single Register Furnace**
5. **Payne Winter Air Conditioner**
6. **Payne Modernair (Blower-Filter) Unit**

Write now for our illustrated booklet on Payne Gas Heating Products.

•

PAYNE FURNACE & SUPPLY COMPANY

BEVERLY HILLS • CALIFORNIA



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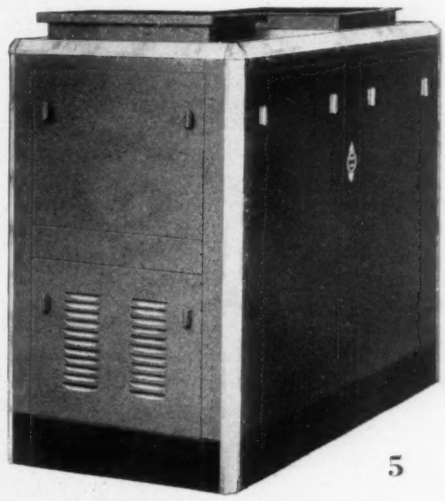


5

for every Gas heating problem

which the equipment is connected. It also allows for flexibility of operation of the equipment, and maintains a uniform operating setting of the appliance regardless of variations in street or main pressure.

The Electric Supply

Most gas heating equipment, except that which is manually operated, depends in some form or other on the electric supply for the purpose of operating valves or controls which make for complete automatic operation of the customer's equipment. This electric supply either operates valves which turn the gas on and off or operates secondary valves in control circuits which allows gas pressure to turn gas actuated valves on and off. It also is the means by which all controls can be tied in to the supply of gas in that they can be connected into the electric circuit in such a way that their operation will be equivalent to a switch in the line controlling the electric supply, each control (switch) operating under the influence of the conditions for which it is intended. For instance, a hot water limit control would influence the supply of gas in relation to water temperatures; if a steam control, this control would influence the supply of gas in terms of steam pressure on the heating system; etc.

In the present day heating applications, particularly where there are many split systems and winter air conditioning systems, this supply of electricity is of course an essential factor in that blowers must be operated by electric motors and also tied in with the control system.

For the sake of clarification, the electric supply has been divided into three classifications—line voltage system, transformer, low voltage system. Line voltage system is the supply which would normally operate electric lights and various electric appliances in the building or residence which would be connected to the house wiring.

The transformer is used to transform the line voltage to a lower voltage, thus making it possible to connect control circuits without heavily insulated wire. It also limits the amount of energy which can be actually dissipated through a control system, therefore insuring safe and simple operation.

The low voltage system is made up of the various electric controls which are joined together by wires which conduct the electrical energy to the various controls. These controls are the relays, thermostats, etc. The electrical energy to these controls is conducted in such a way that the automatic gas valve is made to turn the gas supply on and off as the various controls indicate that the condition is such that the gas should be on or off, and as the various safety devices indicate it is safe to turn the gas on or off.

The low voltage system usually operates between 15 and 20 volts as compared to the line voltage system of 110 and sometimes 220 volts on the house circuit.

To go into minute detail on the low voltage control system would cover many paragraphs and pages. Suffice to say here that this represents the means by which the automatic gas heating system is animated into action or out of action as conditions representing the requirements of a gas heating installation takes place.

The importance of the supply of gas and electricity and the importance of a proper knowledge of its various functions and coordination of such functions undoubtedly can be best illustrated by the two companion tables which accompany this article, listing a classification of causes for heating complaints in connection with gas house heating, resulting from the improper supply of gas and of electricity. These tables are made up in chart form and show the type of complaint that a customer may have in connection with space heating and the faults causing it. These are classified under type of complaint and the fault in gas or electric supply that would cause it. The compilation is not given with the intention of emphasizing the faults that may occur with gas or electricity, but with the thought that complete satisfaction can be rendered only when consideration is given to these factors in trying to solve a heating problem.

International Aspects of Natural and Manufactured Gas

• **E. R. WEAVER, United States National Bureau of Standards, Washington, D. C.: in paper to Third World Power Conference, Washington, D. C., September 7-12, 1936; entitled "Organization of the Production, Transportation and Distribution of Natural and Manufactured Gas," summarizing a group of 16 papers on this subject as presented to the Conference.—(Abstract by GAS, omitting United States of America data).**

THE group of 16 papers on the organization of the production, transportation and distribution of natural and manufactured gas presents some very interesting comparisons and contrasts. The principal contrast exists between conditions and practices in the United States of America and those of European countries.

The major cause of this difference is the greater abundance and more varied character of the natural fuels of America. Not only is the enormous production of natural gas without parallel in Europe but the availability at comparatively low cost of petroleum, both as a material for manufacturing gas and as a competitor, has a profound effect on the gas industry; while the superiority of anthracite to coke for use as a smokeless domestic fuel gives to the carbonization of coal an entirely different place in American than in European fuel economy. Dissimilar legal and financial arrangements on the two continents also play a large part in the contrast.

In substantially every European country, public ownership of the facilities for gas supply is either predominant or equally as widespread as private interests.

A hasty perusal might lead to the conclusion that contrasting systems of organization have developed also in different European countries, but a more careful review tends to make it appear that the evolution of the gas industry in each country has been strikingly similar, and that existing differences in organization represent, primarily, different stages in that development.

In Great Britain and France the coke-making and gas-making industries are still largely separate and non-cooperative, although one or two relatively small grids, connecting several coke plants, exist in each country. It is the opinion that the extensive development of such systems will prove uneconomical and that the distance over which it will ordinarily prove advantageous to transport gas is short, about 20 miles in England and 31 miles in France. It has been suggested for Great Britain that the country be divided into convenient zones with gas-producing stations at intervals of about 20 miles and with distributing systems interlinked. The location of gas works, coal supply, and markets are considered more important than size.

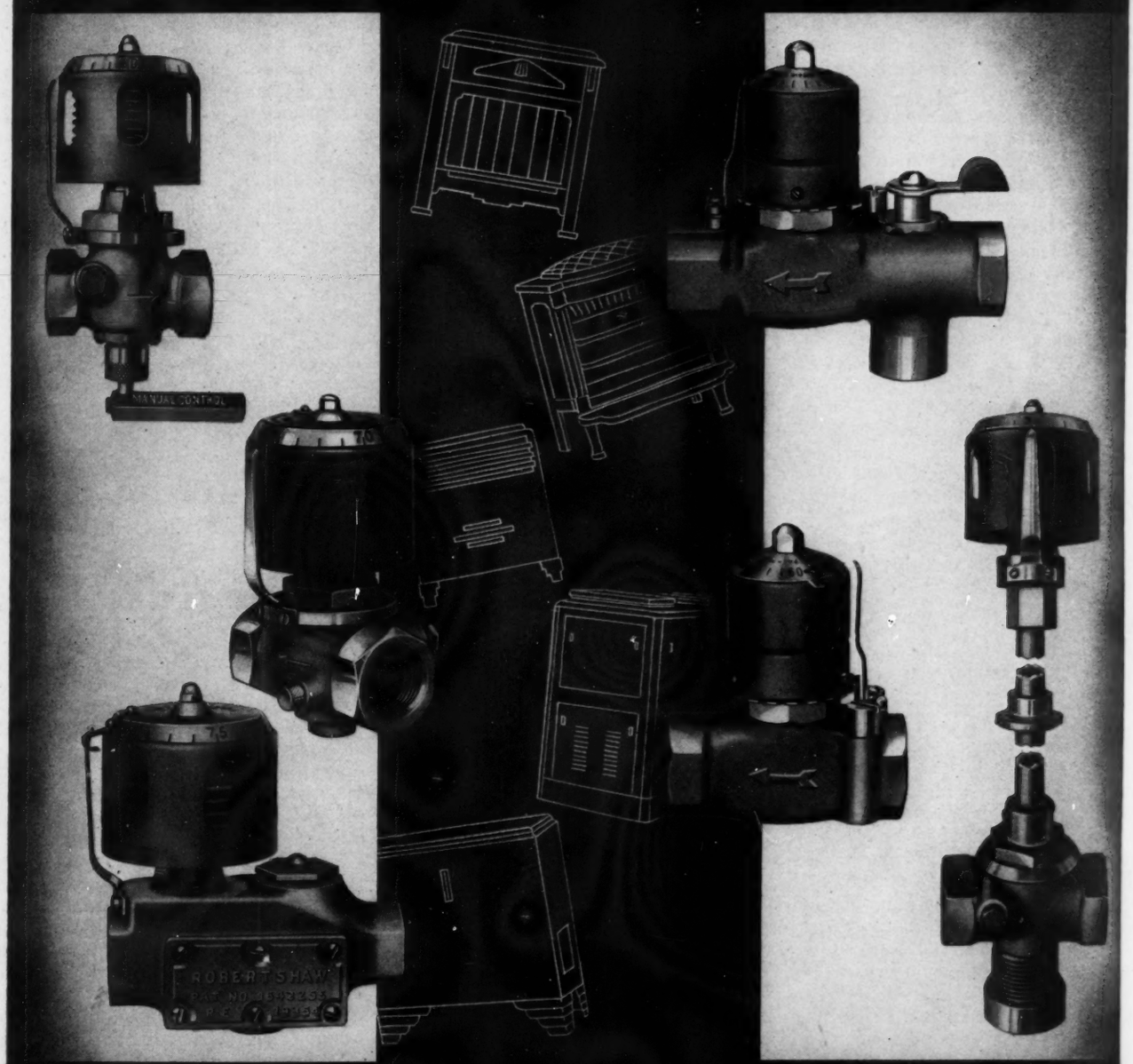
The industry in Germany is much more highly organized, and rapid progress is being made toward a still more complete unification. More than half of the gas used by the nation is drawn from large networks supplied from coke works located at the mines. Since 1928, gas from this source has increased sixfold, while gas from all sources has increased about 60 per cent. Of the present supply, 62 per cent is from coke plants and 38 per cent from gas works.

The supply of gas from the collieries

ROBERTSHAW

FOR THE MOST DIVERSIFIED LINE OF

SPACE HEATER THERMOSTATS



ROBERTSHAW THERMOSTAT COMPANY

YOUNGWOOD, PENNA.

Manufacturers who have specialized in thermostats since 1899

is accomplished by three different groups of enterprises. The first group (producers) are mining companies which produce gas at their coking plants as a by-product and, after extracting the valuable constituents such as benzol, tar, and ammonia, use part of the gas themselves, deliver another portion directly to neighboring industries and cities, and sell the remainder to the "long-distance" gas companies. The long-distance gas companies (transporters) remove sulphur, cyanide, and naphthalene, compress the gas, and transport it through their own long-distance pipe lines to large consumers. The third group (gas consumers) consists of cities, distributing companies, and industrial works, which deliver the gas to the individual places of consumption.

In one of the great German networks the management has for its object the delivery of gas to every station at every moment as economically as possible; but at the same time its share of the total must be drawn from each producing unit. It is necessary to calculate in advance not only the daily but also the hourly load in every pipe line. In doing this, careful study is given to weather reports and to "the events of daily life which could affect gas sales in each district." An elaborate system of telephones and telemetric devices and the remote control of valves makes control possible from a central station. Intermediate compressor stations are under the control of local operators, who receive their orders by telephone. Metering by rotary volume-displacement meters is superseding metering by flow meters. Gas is sold at thermal rates to very large consumers, but to others by volume.

Belgium and Holland present systems of organization intermediate between those of England and France on the one hand and Germany on the other. In both countries, plans for the organization of the fuel industries on a national scale are well advanced, and both contemplate the full use of the gas from coke plants, supplemented by the more efficient of the existing gas works. Distribution will be accomplished through existing systems, probably united into "district" units.

Denmark, Sweden, and Norway have very simliar conditions of gas supply. The gas plants, which are mainly municipally owned, were built originally for the purpose of public gas supply, but because of the demand for coke, much of which is imported, they are in the fortunate position of being able to operate at full capacity at all times as coke producers.

Austria, Czechoslovakia, and Hungary present similar pictures with one large and very progressive plant and a considerable number of relatively small plants in each. No movement toward unification is noted.

Western Europe has very little natural gas. A publicly owned supply of about 15 million cubic meters (530 million cubic feet) annually is used for the generation of electricity in the municipal plant of Vienna. The Hungarian Government was a pioneer in the scientific exploration and development of natural-gas resources in Transylvania, now a part of Roumania; but only two small sources of supply now exist in the country and distributed locally.

In the Argentine Republic, Buenos Aires and five other large cities are supplied with coal gas; three cities receive water gas carburetted with oil; and two small towns receive natural gas.

All the important cities are grouped near the capital. The wide area they cover, the rapid growth of population and industries, the even temperature and high humidity of the subtropical climate, which produces an enviable load factor but excessive corrosion, the lack of a local chemical industry to absorb by-products in their crude state, and the presence of many immigrant groups with varied domestic customs combine to produce a series of problems different from those of other countries.

There are several sources of natural gas, the most important of which is located at Rivadavia, 1,100 miles from Buenos Aires. This supply of gas has tremendous possibilities if transported to the metropolitan area, which has a population of about 3.5 million and an estimated potential daily consumption of 18 million cubic feet. This estimate amounts to about five times the present gas send-out (in energy content) but to only about one-third of the production of the field.

The use of liquid gases (propane and butane) or gas compressed in cylinders is growing in substantially all countries reporting. In Holland these gases are marketed by companies independent of the public utilities. In Europe they are, in nearly all cases, supplied by the regular gas companies as an extension of their service. In Germany the development of uses for compressed gas is particularly active; 32 stations for charging cylinders carried by motor vehicles are in existence or under construction, and an extensive future for this use of gas as a motor fuel is predicted.

Nearly every country has one or more gas associations, which perform a variety of functions. In all countries in which they exist, they supply information and advertising material to their members. Holland maintains testing laboratories for gas-burning appliances. Great Britain has a cooperative coke-marketing agency, but none for other by-products, although cooperative arrangements are made for the distillation of tar. A Swedish association markets its members' by-products other than coke. The Austrian association promotes an agreement among its members as to prices of fuels and other materials but does not act as a purchasing or selling agency.

The Economics of Unaccounted-for Gas

● F. A. HOUGH, Southern Counties Gas Co., Los Angeles, Calif.; addressing Technical Section, Pacific Coast Gas Association Annual Convention, San Francisco, Calif. August 25-28, 1936—(Abstract by GAS).

THIS paper deals only with the economics of leakage mitigation in existing distribution systems, assuming that the only benefit to be gained by reducing leakage is the cost of the gas saved. This exclusion of safety considerations does not necessarily introduce an error in the results, because in most cases a leak large enough to create a serious hazard is too costly to leave unrepaired. Rarely are there enough data available to permit a mathematical solution of a problem in unaccounted-for gas economics. However, a knowledge of the theory involved in such a solution is of value to anyone who must make decisions concerning these matters.

Leakage Mitigation Projects Requiring Capital Expenditures Only. Probably the simplest of all problems in unaccounted-for gas economics are those in which the immediate expenditure of a known amount of money will stop permanently a leak of known magnitude, the question being: Is the cost of the gas lost great enough to justify the expenditure required to stop the loss? the answer is yes if the annual cost of the gas lost exceeds the annual fixed charges on the investment required.

The installation of a leak clamp on a leaking bell joint in a cast iron main offers an excellent example of a problem of this type. While the rate of leakage from such a joint is usually not known and cannot be determined without uncovering and testing, a few typical joints in a long run of pipe can be examined and a computation then made.

Leakage Mitigation Projects Involving Both a Capital Expenditure and an Increase in Certain Operating Expenses. The difference between this and the preceding type of problem is that in this case the saving in gas resulting from a reduction in unaccounted-for must not only pay the fixed charges on the invest-

The PUBLIC *and* THE UTILITY BOTH PROFIT from the advantages of *non-rust*

EVERDUR TANKS

STRENGTHENED COPPER

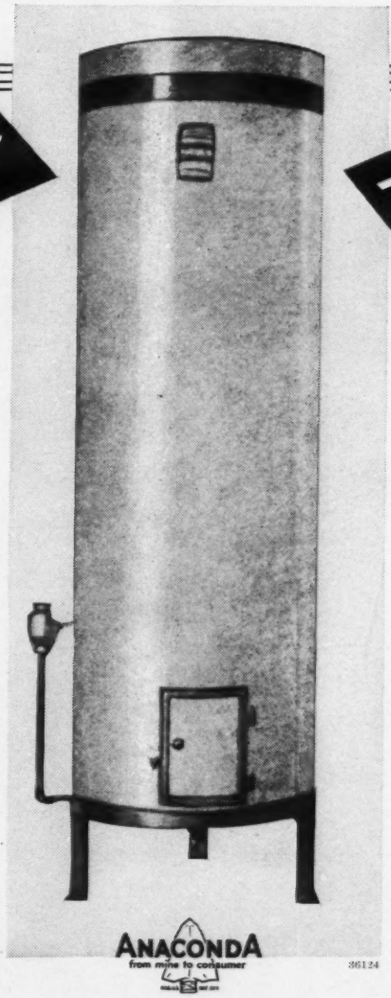
Everdur Metal is copper...strengthened by the addition of silicon and other elements. It is moderately priced, strong and immune to rust. These are the basic reasons why Everdur tanks are more advantageous both for the utility and the public.

THE UTILITY *Benefits-*

In steadier gas consumption, because tank rust and rust-repairs never interfere with efficient heater operation. Costly service calls are reduced . . . customer-satisfaction increased. And since Everdur tanks can never fail because of rust, they provide the utility with *a sound basis for longer-term payment plans.*

•

THE AMERICAN BRASS CO.
General Offices: Waterbury, Connecticut
Offices and Agencies in Principal Cities
In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ont.



THE PUBLIC *Benefits-*

In the assurance of plenty of clean, rust-free hot water indefinitely... in the elimination of all tank repair and replacement expense caused by rust ...in the reliable service which, over a period of time, more than returns the original extra cost.

•

Twenty-four leading manufacturers of automatic gas storage water heaters now standardize on welded Everdur tanks for rust-proof models.

EVERDUR METAL
"Everdur" is a registered trade-mark identifying products of The American Brass Company made from alloys of copper, silicon and other elements.

EVERDUR METAL FOR TANKS

A COPPER ALLOY WITH THE STRENGTH OF STEEL

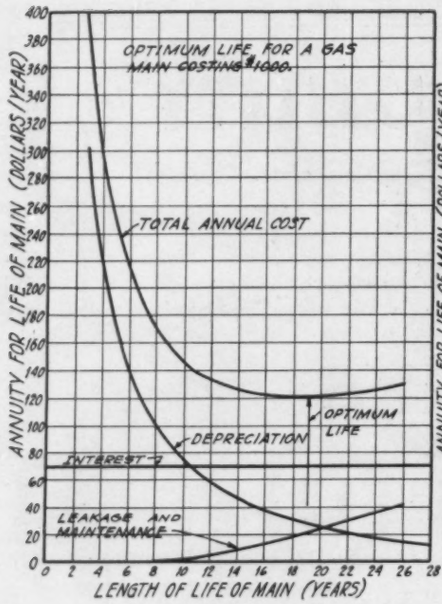


FIG. 1-A.

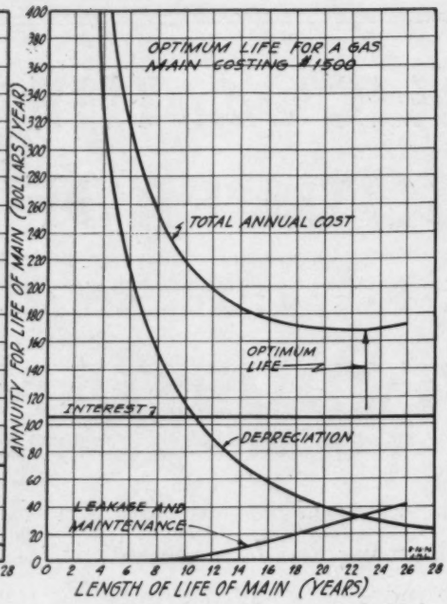


FIG. 1-B.

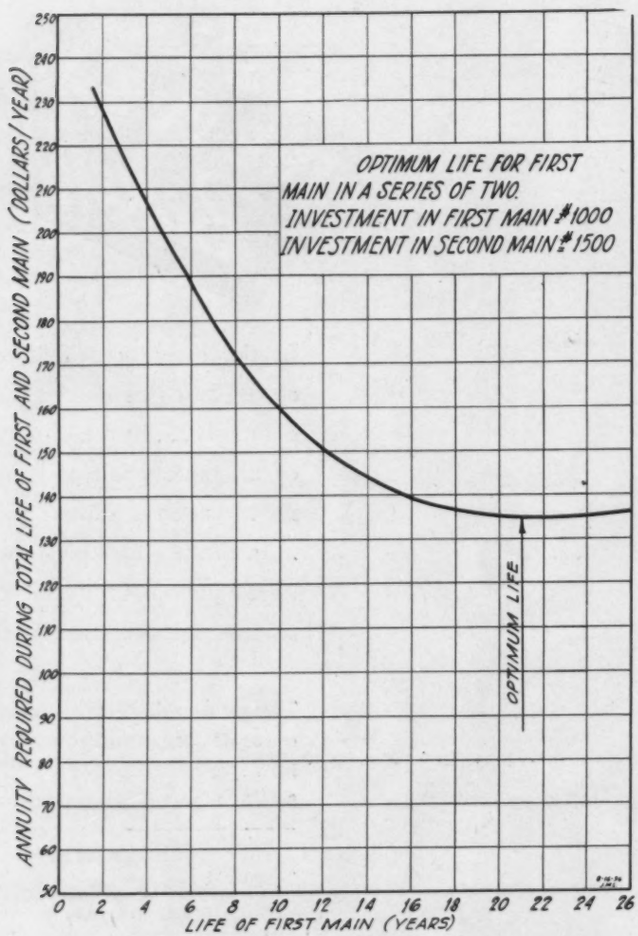

OPTIMUM LIFE FOR FIRST MAIN IN A SERIES OF TWO.
INVESTMENT IN FIRST MAIN $1000
INVESTMENT IN SECOND MAIN $1500
OPTIMUM LIFE
ANNUITY REQUIRED DURING TOTAL LIFE OF FIRST AND SECOND MAIN (DOLLARS/YEAR)
LIFE OF FIRST MAIN (YEARS)

FIG. 2.

ment in new equipment, but must also pay the operating expenses of the new equipment. Installation of equipment to make possible the closer control of distribution pressures offers a problem of this type; for example, a long distance pressure gauge to record at an operator's desk the pressure existing in the distribution system at the point of minimum pressure; knowledge of this pressure makes it possible for the operator to keep pressures down at all times to the minimum required for good service, thus reducing leakage. Inasmuch as leakage is proportional to gauge pressure, a means of reasonably accurate calculation is available.

Leakage Mitigation Projects Involving the Replacement of an Existing Structure with a New One. It is more difficult for engineers to agree concerning the answers to economic problems involving the replacement of one worn-out or obsolete structure with a new one of the same or improved type. The lack of agreement is due both to the great difficulty (and often impossibility) of obtaining all of the data necessary for the solution of such a problem, and also in some cases to a lack of understanding of the theory involved.

The question as to whether a main which is leaking a known amount but is otherwise satisfactory should be replaced or not with a new main is a good example of a problem of this type. The cost of owning, maintaining and operating a gas main can be expressed as a series of uniform annual payments starting one year after the main is installed (or purchased) and continuing until the main is retired. This annuity is the sum of the following three annuities. (For the sake of simplicity, taxes have not been included).

1. Interest on the investment.
2. Depreciation annuity.
3. An annuity which will just be adequate to pay maintenance expenditures as they arise and the cost of leakage as it occurs.

Consider now the effect, in the usual case, of length of life of main on each of these three items of cost:

1. Annual interest charges are fixed by the total investment in the main and by the rate of interest. As long as these two items remain constant, the annual interest charges are a constant. They are not affected by the length of life of the main.

2. The depreciation annuity required to write off an investment in a gas main *decreases* rapidly as the life of the main is extended.

3. Usually, the maintenance and leakage costs for a new main are very low. Deterioration of joint materials and corrosion usually cause an *increase* in these costs as the age of the main increases.

These three items of cost and their total are plotted for a typical case in Fig. 1 (A).

It should be clearly understood that the curves given in Fig. 1 represent in each case uniform annual payments starting one year after the main is installed and continuing until the main is finally retired. For example, the cost of leakage curve intersects the 18-year

. . . "and
who will show
the most interesting heater display
at the convention,
Princess Goloop?"
See Booths
221-222
for the
Answer
A. G. A.
CONVENTION
Oct. 26-30
ATLANTIC CITY
NEW JERSEY

life abscissa at $19.71 per year ordinate.

This means that, under the conditions assumed in the problem, an annuity of $19.71 per year would have to be paid, starting one year after the main is installed and continuing until the end of the 18th year, to pay for all the leakage and maintenance occurring during the 18-year lifetime of the main.

The life for which the annuity covering the total annual cost is a minimum in the most economical life for a gas main and is hereafter referred to as the optimum life. In the case plotted in Fig. 1 (A), the optimum life is 19 years.

This statement must be qualified to the extent that it applies accurately only if the new main will cost approximately the same as the old one and will have approximately the same leakage and maintenance history. If this is not the case, a slightly longer or shorter life than the optimum one shown by the curve in Fig. 1 (A) might be better.

Consider, for example, that the new main will have to be installed under pavement while no pavement existed at the time the old one was installed. As a result, the new main will cost $1500 instead of $1000. The leakage history of the new main is expected to be the same as that of the old. The annual-cost annuity for a range of lives for the new main have been plotted in Fig. 1 (B), which shows that the annuity reaches a minimum of $170.60 per year for a life of 23 years.

Since the total annual-cost annuity for the old main reaches a minimum of $122, it might seem to be questionable practice to retire a main requiring that low an annuity and replace it with one requiring a $170.60 per year annuity. Fig. 2 has been plotted to determine the best time to retire the old main under these conditions.

Trends In Gas Appliance Design

● **F. E. VANDAVEER, Supervisor, American Gas Association Testing Laboratories; addressing Manufacturing Section, Pacific Coast Gas Association Annual Convention, San Francisco, Calif., August 25-28, 1936. —(Abstract by G A S).**

TO be successful in the gas appliance industry of today and tomorrow, manufacturers must continue to improve and perfect their appliances and develop new ones. Keeping abreast of or in advance of competitive designs to maintain and increase sales is becoming more and more of a necessity.

More rapidly than is generally known, the industry is making use of scientific studies and research. With the increasing application of accessories for complete automatic operation of appliances, improvement in efficiencies, more symmetry and beauty of external appearance, it becomes necessary to maintain closer tolerance and greater accuracy and precision in manufacturing processes. Not only does this change necessitate better factory machinery, but employment of more scientifically trained men. Many companies are realizing the truth of this statement as evidenced by the fact that the American Gas Association Laboratories alone have supplied about fifteen men to the appliance industry within recent months, and over a period of ten years approximately fifty men from the Laboratories have been employed by manufacturers.

▲

FIG. 1.

Two recently developed gas space heaters, similar in appearance to floor lamps and flower pots, and typical of trend toward restyling of appliance lines.

▼

As progress in development of each of the four major types of appliances is entirely different, a brief resume of each one will be given:

Central Heating Gas Appliances

In this field the subject receiving the greatest amount of public attention is air conditioning. On the Pacific Coast this development had its beginning in the increased use of forced air or blower type furnaces for winter air conditioning, with features of air cleaning and humidifying, and provision for attachment of parts for summer air conditioning.

There is an ever increasing use of accessories for more automatic control of furnaces and for greater safety from explosion. Instead of working against this development, manufacturers should devote their energies toward perfecting the accessories used. Many are making considerable headway in this direction.

Since the recent development of a compact blower basement furnace, several other new types of appliances have appeared on the market, among these being floor furnaces with blower, floor furnaces with thermostats and safety pilots built in the units themselves, and unvented floor heaters and wall heaters.

Water Heaters

There has been a marked tendency toward increasing the efficiency and lowering the standby loss in automatic storage water heaters; more attention is being paid to heating surfaces, baffles, secondary air inlets, pilot consumptions and insulation. Also there is a marked trend toward improving the outside appearance. The new fin type instantaneous water heaters are one of the latest developments.

In the east and midwest, there has been considerable activity in the development of attachable water heaters without water carrying parts, making it easier to convert a range boiler tank into a complete automatic gas water heater. This development has not been promoted very actively on the Pacific Coast.

Space Heaters

The use of thermostats for controlled room heating is receiving attention of both gas companies and manufacturers; this also necessitates, in many instances, the use of thermostatic pilots. The most noticeable change in design in recent years is modernizing the appearance of cabinet or outside jackets.

In the way of new space heaters, different in design from the usual circulator radiant heater type, are those developed in Southern California with appearances similar to a floor lamp or a flower pot. Examples are shown in Fig. 1.

(Turn to Page 30)

Here Is A Market Of Millions Of Cubic Feet

Tell the Facts About Humphrey Gas Unit Heaters to Every Commercial and Industrial Account . . .

Retail stores of all kinds, factories, warehouses, garages, filling stations, auditoriums are all good prospects now for gas heating through Humphrey Gas Unit Heaters. Write today for the new 1937 Forced Circulation Heating Equipment Portfolio that gives complete sales ammunition and shows the advertising helps we supply without charge.

Gas unit heaters are especially favored in milder climates. Typical west coast and southern installations are shown. But climate has little to do with the popularity of this better, cleaner way to heat small or large areas. Thousands of installations, many now nine years old, boost gas loads and profits for the companies that made the sales.

Exclusive Humphrey Features

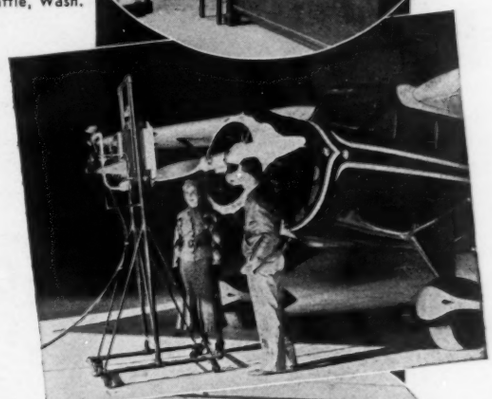
This Company pioneered the development of the gas unit heater and each year has set the pace with further improvements that make selling and servicing easier. Exclusive features are the all-steel base casting that is more durable, rubber mounted motors to eliminate vibration, positive safety controls that are easily demonstrated to customers, construction so that all parts are readily accessible for inspection, and popular low prices.

There are models with hourly BTU capacities of 60,000, 75,000, 125,000, 200,000 and 400,000 for any size commercial heating job. Send for complete catalog containing heating estimate data.

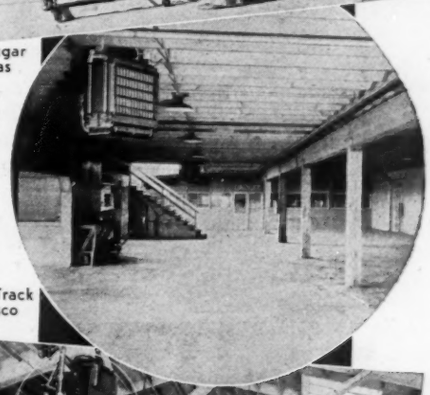
EASTERN OFFICE
23 Warren St.
New York City

WESTERN OFFICE
135 Bluxome St.
San Francisco

Retail Store
Seattle, Wash.



Airplane Hangar
Dallas, Texas



Baden Dog Track
San Francisco

Biscuit Factory
San Francisco

GENERAL GAS LIGHT CO., KALAMAZOO, MICH.

• WRITE FOR HEATING CATALOG

Ranges

Many improvements have been added to gas ranges in recent years. Nevertheless, manufacturers of these appliances are still bringing out new and more desirable designs. Among the most recent developments may be listed the following:

Ovens which are capable of maintaining accurate temperatures as low as 200°F. permitting low temperature oven cooking and canning; burners so designed that faster heating may be obtained, so that ovens may now be brought up to 500°F. in less than ten minutes time; a separate broiler burner placed at a higher elevation than in the old table top oven type, and located underneath the top burner section; increased efficiency and speed of gas range top burners which on some ranges have also been moved to a different and possibly more convenient location on the range.

Another important development of recent origin that has unquestionably influenced design and improvement in domestic gas ranges is the research work being carried out at the main Laboratory in Cleveland which is sponsored by Mr. F. J. Rutledge's Committee on Domestic Gas Appliance Research. This work has been in process intermittently for almost a year and to date some six progress reports have been completed that affect every important feature connected with gas range performance and design. Three of these reports have been summarized and presented verbally to representatives of the majority of the manufacturers now producing approved types of gas ranges. Manufacturers who have not yet secured this information, should take prompt steps to do so. Furthermore, some new and interesting information will be available shortly that should likewise be obtained.

At the end of the tenth month of the present A.G.A. Fiscal Year, there had been an increase of 6.6 per cent in total amount of test work done by the Pacific Coast Branch Laboratory as compared to the same period last year. There had been almost an equal amount of work on each type of appliance, with the most testing being done on water heaters which accounts for 28.9 per cent of the total, central heating gas appliances 24.4 per cent, ranges 20.8 per cent, space heaters 19 per cent, and accessories 6.9 per cent.

Trial Industrial Installations ...When Are They Justified?

● **F. B. JONES, Director, Industrial Gas Sales, Equitable Gas Co., Pittsburgh, Pa.; addressing 1936 American Gas Association Industrial Gas Sales Conference.—(Abstract by G A S).**

BY a trial or test installation is meant a job where the use of gas is put on trial or "weighed in the balance" as the case may be, and the gas company assumes a monetary risk if the job fails to operate satisfactorily. A number of questions must immediately arise in the mind of any gas company executive when considering such a procedure.

1. Why is it necessary to use such procedure to save or obtain industrial gas loads?
2. Are salesmen using test or trial installations as a substitute for salesmanship?
3. Why won't the industrial equipment manufacturers take the risk on such jobs? Don't they sell the equipment for these jobs?
4. Why won't the industrial customer take his own chances in applications of gas if such applications are supposed to save him money, time, or improve his product?

The following arguments are given in order to justify the author's position that limited and careful use of trial industrial gas installations is justified.

The consuming public in general, including those in plants to which we must sell industrial gas, have been taught by other merchandisers of services and equipment to expect proved or guaranteed performance in a piece of equipment or apparatus that they contemplate buying. It is therefore little wonder that in many cases the industrial plant executive demands from the industrial gas salesmen, either a guaranteed performance of an industrial gas installation as to quality or gas consumption, or permission to put the installation in on trial. Since, in most cases, a trial installation is more desirable than a guaranteed performance or a guaranteed gas consumption, there is often little choice for the industrial gas man.

Experience also shows that a trial installation often tends to lower sales resistance and hasten the acquisition of a new load, particularly in a plant where gas is not widely used or where the management is not particularly familiar with the applications of industrial gas and its results.

The gas company executive or the industrial gas manager who waits and relies entirely upon the equipment manufacturer to make trial installations or install guaranteed performance equipment will miss many profitable new gas loads for his company. Most of the manufacturers of industrial gas equipment are relatively small, cover a very wide territory, and are financially unable to take much risk in proving that gas will do a particular heating job. Also, in many cases, a particular application of gas requires an investment that consists of only a small percentage of gas burner equipment and related apparatus, and a much larger percentage of mechanical equipment such as blowers, brick, insulation, instruments, etc.

The gas company executive may often wonder why the customer does not do his own experimenting and try out gas on his own heating applications at his own expense. The best answer to that question is the fact that the industrial customers' managements are not always easily convinced that gas is the proper solution for their particular heating operations although the industrial gas salesmen may be skillfully telling them that gas heat is the proper solution.

The following are pre-requisites to a trial installation:

1. The particular heating operation must be important to the customer.
2. The potential or existing gas load must be worthwhile to the gas company.
3. A thorough analysis of the customer's requirements must be made and the gas company representatives should be convinced that gas can give such requirements.
4. The immediate territory should be investigated to see if a parallel installation can be found and used as a demonstrator.
5. The most economical equipment and design for the gas application should be selected, consistent with the customer's requirements.
6. The customer's entire personnel should be favorable towards gas and willing to give it a fair trial.

Some gas company representative should be personally delegated to supervise the actual installation. Usually when a trial installation is made no one in the customer's plant can be relied upon to take the necessary personal responsibility to see that the installation is made as planned, and improper installation of good equipment or improper initial starting of a good installation may defeat the whole purpose of the installation or give the gas job a bad start-off.

■ ■

Silver City on Natural Gas

On September 14, two weeks ahead of schedule, natural gas arrived at Silver City, New Mexico, according to an announcement by C. C. Tucker, vice-president and general manager of the Lea County Gas Co., the distributing company. Tests on the transmission line from Gage in the southern part of Lea County to Silver City as well as on the mains within the city have been completed. An attractive building has been remodeled and will serve as the company's downtown office.

Fine QUALITY ENAMELED PRODUCTS REQUIRE FINE QUALITY ENAMELING SHEETS

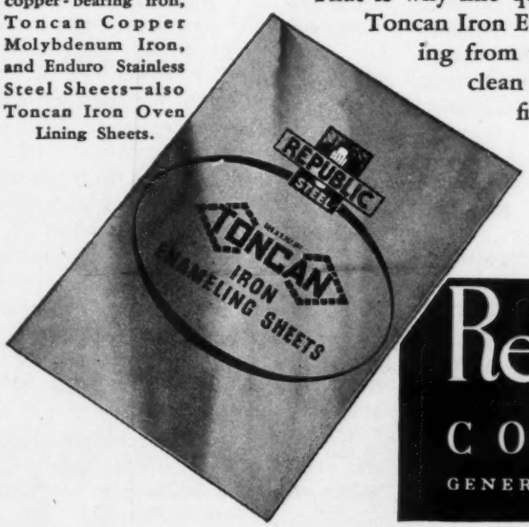
● Vitreous porcelain enamel works wonders. Through its application a plain sheet of iron becomes a glass-smooth, sanitary, beautiful part for a range, refrigerator, table, washer, ironer or kitchen cabinet—or it may become a sign, a household utensil, a store or building front, or any one of countless articles now made of enameled metal.

But the beauty and usefulness of vitreous porcelain enamel, magic-like as it is, are limited by the quality of the iron sheet to which it is applied. The enameling process will change the sheet's appearance—but it cannot remove flaws and defects that may exist on or below the sheet's surface.

That is why fine quality enameled products require fine quality enameling sheets—Toncan Iron Enameling Sheets. These sheets are processed especially for enameling from the furnace to the final inspection. Every sheet is perfect—with a clean flawless surface. Every sheet takes and holds a fine enameled finish—produces better quality products—reduces number of culls—increases manufacturers' profits.

It will pay you to investigate Toncan Iron Enameling Sheets—the sheets processed under strict control of experienced metallurgists and ceramists. Write for further information.

Republic produces plain carbon steel, copper-bearing steel, copper-bearing iron, Toncan Copper Molybdenum Iron, and Enduro Stainless Steel Sheets—also Toncan Iron Oven Lining Sheets.



Republic Steel
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GENERAL OFFICES · · CLEVELAND, OHIO

Maintenance of Cast Iron Mains

● **H. F. CARR, Pacific Gas and Electric Co., San Francisco, Calif., addressing Technical Section,, Pacific Coast Gas Association Annual Convention, San Francisco, Calif. August 25-28, 1936—(Abstract by G A S).**

LEAKING joints in cast iron mains are repaired by the use of leak clamps of the type employing a shroud ring or gasket retainer. This type of clamp holds the rubber gasket securely in position and does not allow it to roll away from the face of the bell, or the surface of the spigot, as the clamp is tightened during the installation.

Excavations are made 10 or 12 inches below the pipe, and when necessary are flared out or widened at the bottom to allow greater working space with a minimum paving cut; attempt is made to locate these excavations so the face of the bell is approximately two feet from the front of the hole, to allow room for the use of pneumatic tools in cleaning the joint. Before the joint is prepared the clamp is tried for fit, as the tighter the clamp fits to the pipe the better the repair. If the spigot of the pipe does not fit into the bell squarely, or is out of line, no attempt is made to install a leak clamp.

Cleaning and preparation of the bell joint is of the utmost importance. Scale is removed from the back and face of the bell, and for a few inches along the spigot, by the use of a pneumatic scaling tool. The face of the bell, and the surface of the spigot against which the rubber gasket is clamped, is then ground smooth using a small multi-vane grinder. If the lead is recessed from former recaulking, the face of the bell is built up flush with casting plaster.

The rubber gaskets are tried for fit and in most cases overlap due to length. They are cut to size, using a jig and rubber cutting knife with a 1 by 6-inch blade. The jig has a steel clamp which holds the rubber and a guide for the knife, which guide maintains the same angle of cut as the original joint of the rubber. The cutting is done against a wood block with the same diameter as the pipe, different blocks being used in the same jig, corresponding with the various pipe sizes. Fig 1 shows this rubber gasket cutting jig and knife.

The surfaces against which the gasket is to be clamped are then coated with a soap and water solution, which eliminates any binding or gripping of the rubber as the clamp is tightened, and acts as a gasket compound on the finished repair. The rubber gasket is placed in position and the ends fastened together by driving a small nail or brad through the joint of the rubber. The bell ring is then installed and the lock nuts of the stud pulled up tight; the spigot ring is next installed, placing the ring joint ears over the studs and tightening the nuts finger tight. The remaining bolts are then installed, and all the nuts tightened evenly using a ratchet wrench, meanwhile hammering the clamp assembly in all directions to eliminate binding.

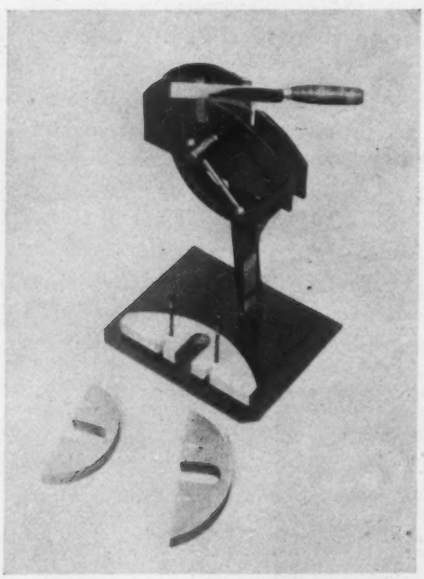


FIG. 1. Rubber gasket cutting jig and knife.

FIG. 2. Protection mask and regulators for air supply.

To safeguard the health of the workers and insure their safety during the chipping and grinding operations in the bell holes, a protection mask or gas mask is worn, supplied with air from the compressor which supplies the pneumatic tools. (Fig. 2). The mask is the type which covers the entire face, with goggles incorporated in it, and has about ten feet of flexible hose; this is attached to a length or two of pneumatic hose, which is supplied with air from the compressor through a filter, a high pressure compound regulator reducing to ten pounds, and a second regulator reducing to 4 to 6 inches water column, which latter pressure is maintained in the face mask. Before putting on the mask, the worker pulls on a light fabric helmet similar to an aviator's helmet, which assists in keeping his head and hair clean.

Gas Hot Water Service Must Be Sold

● **H. N. RAMSEY, President, Welsbach Co., Gloucester City, New Jersey; addressing 1936 Mid-West Gas Association.—(Abstract by G A S).**

ANY general analysis of the domestic load will quickly resolve itself into consideration of the three basis domestic services namely, cooking, water heating, and refrigeration. It is equally important that each of these be supplied by means of gas, as the loss of any one to some other fuel results in a constant threat to the others. For supplying each of these services the gas industry can offer the most modern, highly efficient and attractive equipment, the operation of which compares favorably from the standpoint of convenience and economy with competitive appliances using other fuels.

Of all appliances rendering the three basic domestic services mentioned before, the automatic water heater offers the best possibility for increasing load.

In 1935 the average use per domestic customer was approximately 11 therms of gas per month. The automatic gas water heater in use by the average family will alone consume a greater quantity of gas than this, and its installation in the home of a customer who has not previously enjoyed this service will rarely require the expenditure of additional capital sums for meters, mains, or services. However, the acceptance of this appliance is far from universal. In most cases the objections to its use being attributed to its first cost and to the fear of high operating expense.

The desire on the part of the customer to use a gas water heater must be built around the quality, convenience and economy of the service it will render. Therefore, it is necessary to sell the service which this appliance is capable of furnishing.

No matter how desirable this may be the utility cannot hope to sell gas hot water service if its cost is not reason-

(Turn to Page 37)

"We Have *Faith!*"

•

A message to the Gas Industry

from

JOHN A. FRY

President

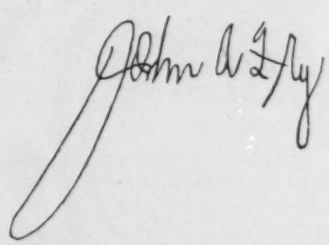
DETROIT-MICHIGAN STOVE COMPANY

THE past ten months have witnessed the greatest forward advance in the gas industry that has taken place in the past decade. Yet, today, the gas industry is but a pigmy compared to the important part it is destined to play in the history of tomorrow.

Your courageous, hard-hitting salesmanship, together with keen and alert merchandising, has opened and will continue to open up new markets. New methods, new ideas, and brilliantly new gas appliances are not only holding their own against competition but are carrying the fight to the opposition.

Optimism pervades the industry, and rightfully so—for engineering skill has already broken down the barriers of price. More and more, the greater convenience and natural superiority of gas is gaining public recognition and will continue to do so year after year.

We, at the Detroit-Michigan Stove Company, know gas is the one ideal fuel, and our inventive and designing abilities are constantly working to bring to this industry the type of equipment which will open new and retain old markets. Gas marches on—and we are proud to be a part of its indomitable progress.



Our Creed

TO BUILD a product so attractive in appearance as to delight the owner's eye, so durable as to provide years of lasting service, and so fairly priced as to meet the most exacting buyer's standard of value.

To so pursue our dealings with our trade as to insure a long and profitable association; to co-operate in mutual understandings for the benefit of all; and to so conduct ourselves as to erect a monument of friendly feeling as lasting as eternity.

This, for a period of seventy years, has been the purpose to which we have dedicated all our thoughts, our resources, and our skill.

DETROIT-MICHIGAN
STOVE COMPANY

DETROIT, MICHIGAN

ably comparable with its competition. When the utility has attended to the rate structure it is ready to approach the actual selling of hot water service. It must build up its sales organization, determine quotas based upon its market analysis, and be liberal in compensating its salesmen. Good advertising counsel should be called in to help plan the campaign. Prospects should be told in no uncertain terms by newspaper, radio, mail, direct solicitation, and by every other means available in the community, that gas can provide a service which they need. They should be made conscious of hot water by gas.

The utility should enlist the support of all of its employees, offering them inducements to use this service, for if they do not use it why should their neighbors? The 125,000 employees in this industry are all potential salesmen. The support and interest of the plumbers and appliance dealers in the community should be secured.

Since our main objective is to sell gas, we must take care that the price and terms under which the appliance is sold are such that the resistance which may be encountered from this source will be minimized. It can be shown in many instances that the desirability of this water heating load is such that if consideration is given to the investment already made in distribution facilities to serve a customer not using water heating service, the utility could well afford to furnish the appliance without charge.

Generally speaking, utilities have given too much thought to the merchandising of appliances and to the direct profit resulting therefrom, and perhaps too little thought to the merchandising of the services which gas can supply.

The basic job of the manufacturer is to design and construct equipment of high efficiency and good appearance, and it must be capable of rendering long, reliable service.

At the present time there are approximately 70 manufacturers of automatic gas water heating appliances for domestic use bearing the American Gas Association Laboratory seal. The sale of a greatly increased number of these appliances is essential to enable the manufacturer to carry on that development of his product which is so necessary to the utility industry, if it is to successfully meet the challenge of competitive fuels.

■ ■

Accident Fatal to McNamara

John B. McNamara, superintendent of the Billings Gas Co., Billings, Montana, was killed September 25 when he was struck by an airplane propellor at the local airport. Mr. McNamara, who was 37, was just leaving on an air trip when the accident occurred.

Breaking In Gas Meters Before Final Adjustment For Proof

● **H. S. HARRIS, Los Angeles Gas and Electric Corp., in subcommittee report to Technical Section, Pacific Coast Gas Association Annual Convention, San Francisco, Calif., August 25-28, 1936—(Abstract by G A S).**

FROM a purely mechanical standpoint the running-in of meters is desirable whether or not it appreciably affects the initial meter proof, for it is known that by running-in the differential across the meter will be decreased for any particular rate of flow, thus indicating that there has been some relief on the wearing surfaces. However, whether or not the running-in of meters is an economical proposition depends on several factors.

H. S. HARRIS

Regarding the economics of running-in meters, consideration must be given to incoming meter proofs, the gas revenue lost in actual service while the meter is speeding up to a pre-determined proof, whether or not there is available floor space to run in the meters, and what the investment in idle meters on the running-in rack would be. It seems logical that a company with a small number of meters would have less diversity of meter proofs than would a company with a large number of meters and, therefore, assuming an equivalent class of repair, it might be more desirable for a smaller company to run in meters than it would be for the larger company. Furthermore, the results obtained by running-in meters should be correlated with the effect of actual service for a period of time. For instance, it has been pointed out by the Bureau of Standards that a tin meter will increase slightly in proof for the first few years in service and then tend to slow down and continue doing so for its remaining life. Therefore it would not be economical, on this basis, to run-in tin meters to the point of complete stabilization, and then encounter in service only the slowing down, with its serious effect on company revenue.

Data supplied by two companies show that there is a possible economical advantage, by saving time in obtaining initial proof, in running-in large meters, although the subcommittee is not offering any demarcation with respect to what sizes of large meters are included. There is also evidence from one company that meters with re-oiled diaphragms will show considerable less change in proof during running-in than will those meters with new diaphragms; from this might be inferred that this company's repair procedure is so good that the greatest effect of running-in is on the diaphragm rather than on the mechanical parts. As a further test on the effect of running-in on diaphragms, six iron meters with new chrome-tanned diaphragms were set at correct proof. The diaphragms were then removed and lightly massaged by hand without attempting to stretch them, and re-installed in the same position in the same meters. Two meters speeded up slightly, but the other four went decidedly slow. From a mechanical standpoint it seems reasonable that a meter will speed up in service until the overall friction coefficient has reached stability. Therefore, there is a possibility that mechanical run-in of the meter parts before installation of the diaphragms might overcome the speeding-up tendency and subject the meter to a slowing-down tendency in service due to some readjustment of the diaphragms.

On the assumption that a factory meter has the best possible repairs, approximately 50 new iron meters and 50 new tin meters were removed from various sections of a distribution system after approximately five months of service, selection being made to include operation on gas of various humidities and sources. Had the iron meters been set at minus 2 per cent outgoing proof, and the tin meters at minus 1 per cent outgoing proof, there would not have been a single meter in the entire group that would not have been within the legal limits of proof. Inasmuch as these meters had passed from ten to 50 thousand cubic feet of gas in the district in which they were to operate for a probable 7 years, it is evident that from an economical standpoint run-in could only have been afforded, instead of setting them at a pre-determined outgoing proof, if the cost of breaking-in would be less than the revenue lost in service during stabilization; while these meters were factory jobs, it would presumably be possible for any repair shop to do comparable work.

To check the practical effect on meter proof of previously demonstrated leather area changes vs. relative humidity of gas, the following tests were made: Pairs of diaphragms were selected with varying depth, from 12 to 22 point, and

these pairs of diaphragms successively installed in an iron meter originally adjusted to correct proof with the 12 point pair; proof was made with each pair of diaphragms; there was no particular consistency or trend in the results, except that they were reproduceable, nor at any test a proof above or below the legal limit; inasmuch as the change in diaphragm area thus produced is greater than that brought about by changes in gas relative humidity varying between 5 and 95 per cent, it is concluded that any significant effect that humidity change may have is due probably to stiffening of the leather. A further test on 30 meters removed from service and operated on a test rack with gas at a very low humidity, indicated that meters whose diaphragms have been subjected to gas of varying humidity, averaging 40 per cent relative, will not be affected significantly if operated on practically bone dry gas.

It is concluded that any company will have to decide for itself whether or not breaking-in of meters is economical, and the tests and statements in the report should be used only to assist this decision.

The Replacement of Gas Services Under Paving

● **J. E. O'BRIEN, Pacific Gas and Electric Co., San Francisco, Calif., addressing Technical Section,, Pacific Coast Gas Association Annual Convention, San Francisco, Calif. August 25-28, 1936—(Abstract by G A S).**

WHENEVER possible, so as to minimize pavement breakage, replacement of services under paving is done by driving single wrapped pipe through the sub-soil, or pulling copper tubing through the old service.

Pipe can be driven when there is sufficient space available and other substructures are absent or can be avoided. Loam soil is the easiest to drive and sand the hardest. Force alone will not suffice to drive sand and must be supplemented by either air or water pressure applied ahead of the pipe. One length of pipe is driven at a time, the battered end being cut off and another welded on if several are needed. A driving head is used to accelerate driving and also to shield the wrapping of the pipe. This driving head is made from a 2-inch Dresser coupling and nipples, as shown in Fig. 1. The end is pointed and has sufficient width to allow ample room for pipe and wrapping, up to 2 inches. The pipe is driven with a pneumatic pavement breaker with suitable attachment to fit the end of the pipe, aided by the pull of a winch, on a tractor, using block and tackle.

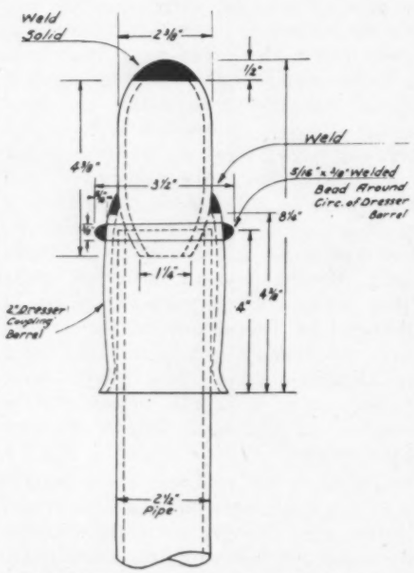


FIG. 1. Driving head for 2-⅜in. O. D. pipe.

FIG. 2. Start of copper tubing through old service pipe.

For installation inside old services, heavy soft streamline copper pipe, with streamline fittings, is used. A fish wire is drawn through the old service, a cable attached and then drawn through the pipe, and the tubing attached to the cable by means of a "come-on". The "come-on" is placed inside the end of the tubing with a threaded end protruding, the edges of the tubing hammered down, and a nut screwed on against these edges to compress them against the head of the "come-on." A nob of metal at the end of the cable, attached to the "come-on," clears the old service pipe of any obstruction and allows ample clearance for the copper tubing. The other end of the cable is attached to a winch on a tractor. Fig. 2 shows a copper tubing ready to start through the old service pipe.

The advantages of copper tubing installations are small excavations and paving costs, limited protective coating and rapid installation. Skilled operators are essential to produce the streamline connections which are the difficult part of the installation.

■ ■

Chicago Steel Plant Finds Ideal Fuel in Natural Gas

(Continued from Page 13)

sure available in the particular building where the furnace is being used. No difficulty is being experienced in heating blocks 12 x 12 x 12 for forging at 22,000 to 23,000 degrees.

Conclusion: The industrial gas engineer need not hesitate in considering natural gas as a fuel in the manufacture of steel. The belief has always been that luminosity is lacking in the natural gas flame as compared with oil or with the manner of applying producer gas. In considering the application of natural gas, more attention should be given to the type of burner used, and the method of application. One type of furnace may require a luminous burner, and another an open pipe, but the point of application may be a deciding factor. It may be advisable under certain conditions to change the area of ports, especially when the change will not interfere with the use of the stand-by fuel, or necessitate a great expenditure. The results obtained at this plant, indicate that the job can be done, and that gas is as flexible a fuel in the manufacture of steel as it is in the hundreds of applications with which the gas engineer is more familiar.

■ ■

Midwest Industrial Sales Council Meets

THE Midwest Industrial Gas Sales Council of the Industrial Section of the American Gas Association held its meeting on September 18 at the Palmer House in Chicago.

Contributing to the program were W. A. Darrah of Continental Industrial Engineers, Inc., Chicago; Herbert E. Ryerson of the Bryant Air Conditioning Corp., and F. X. Mettenet, vice-president in charge of sales of the Peoples Gas Light & Coke Co., Chicago. Industrial papers were presented by J. E. Coleman, Northern Indiana Public Service Co., and R. E. Kluckhohn, Public Service Co. of Northern Illinois.

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Cast iron and alloy cast iron pipe centrifugally or pit cast—for water works, gas, sewerage and drainage service as well as industrial uses involving corrosives.

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ALL INDICATIONS point to a building boom based on low-cost housing. This will necessitate revamping or extensions to transportation lines for water, gas and sewage. Fundamental economy in such construction rests upon the choice of pipe material. While cast iron pipe may involve slightly higher first cost the ultimate cost based on years of service and freedom from maintenance is lower than that of any other material suitable for the purpose. If it is U. S. Super-de Lavaud Pipe, centrifugally cast in a metal mold without chill, you know that it is a tough, ductile material with extraordinary resistance to impact, quickly available from any one of our 15 distribution points.

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U. S. Pit Cast Pipe U. S. Threaded Cast Iron Pipe U. S. Mechanical Joint Pipe
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Flow of Gas In House Pipes

● **N. L. HOFF, Los Angeles Gas and Electric Corp., addressing Technical Section, Pacific Coast Gas Association Annual Convention, San Francisco, Calif., August 25-28, 1936. —(Abstract by G A S).**

MOST municipalities have building codes or ordinances which prescribe the manner in which gas house piping shall be designed and installed. For the most part, these laws are based on obsolete methods of design, and are lacking in clarity and precision, in view of which the following method is presented in partial fulfillment of the requirements.

N. L. HOFF

The Spitzglass Flow Formula has been selected as the most suitable for design problems of this kind. This Formula may be written as follows:

$$Q = 3550\left(\frac{D^5}{1+\frac{3.6}{D}+0.03D}\right)^{\frac{1}{2}}\left(\frac{h}{SL}\right)^{\frac{1}{2}} \quad (1)$$

A complicated equation such as this is entirely unsuitable for use by plumbers and other members of the building trades who are seldom technically trained. For any one set of conditions, however, such as instances where a single gas utility supplies all the gas for a municipality, the forgoing equation may be greatly simplified by substituting the numerical values of specific gravity, flowing temperature, barometric pressure, etc., and combining all these factors as a numerical constant. The formula may then be written as follows:

$$Q = K_L H^{\frac{1}{2}} L^{-\frac{1}{2}} \quad (2)$$

where,

L = Length in hundreds of feet
H = Pressure drop in inches of water column
K_L = An arbitrary constant which is Q's value when the product of the independent variables is unity.
Q = Gas delivered in standard cubic feet per hour

Since the law usually stipulates the permissible pressure loss in a system of house piping, such as 0.2 in. W.C., this value may be substituted and thus eliminate (H). For example:

$$Q = 0.447\, K_L L^{-\frac{1}{2}} \quad (3)$$

No further progress in simplification is possible unless a linear approximation may be made for the curvilinear function representing the length. There are many such approximations, but the one which seems to fit the requirements of this particular problem best is:

$$\left(\frac{1-L}{2}\right)+L$$

Replacing the reciprocal of the square root of (L) in equation (3) by this straight line approximation, there is obtained:

$$Q = \frac{0.447\, K_L}{\left(\frac{1-L}{2}\right)+L} \quad (4)$$

which, upon simplification, may be written in the final form:

$$Q = \frac{K_p}{100 + L_A} \quad (5)$$

in which,

L_a = Actual length of the pipe in feet
K_p = Various numerical values as shown below

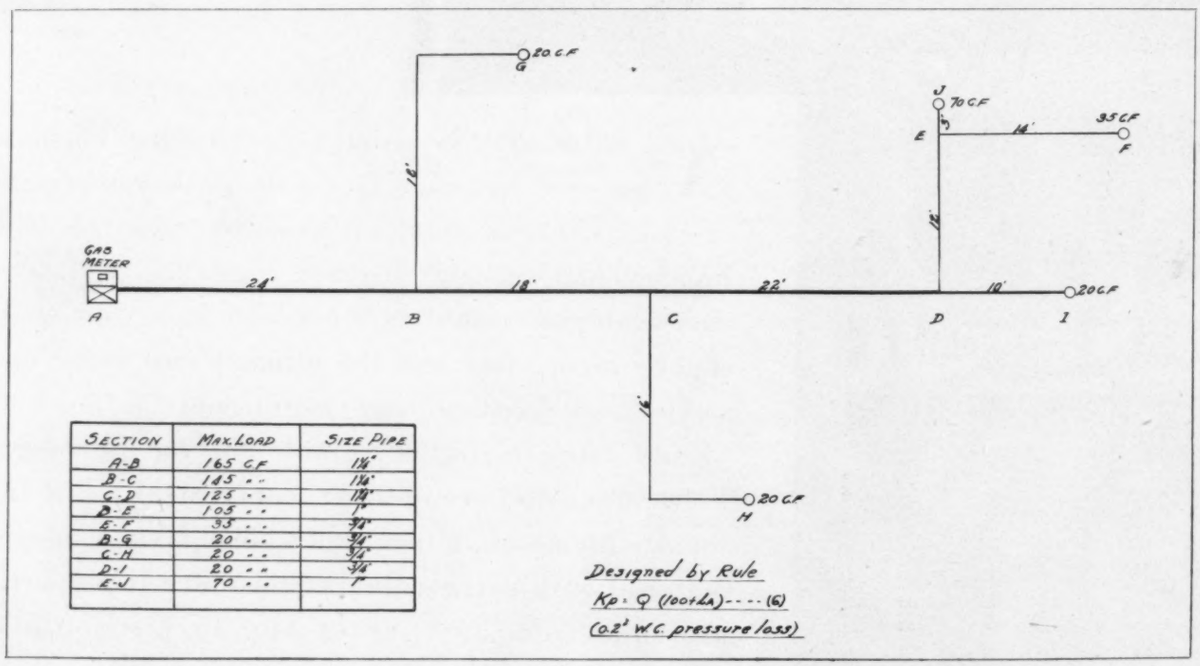
Values of K_p for Various Pipe Diameters

½ in.	4,381*
¾ in.	10,013
1 in.	20,204
1¼ in.	44,432
1½ in.	68,927
2 in.	139,375

In the actual design of gas house pipes it is usually necessary to determine the size of the pipe and not the quantity of gas which will be discharged; consequently, equation (5) should be transposed in terms of K_p thus:

$$K_p = Q\,(100 + L_A) \quad (6)$$

* Many ordinances prohibit installation of ½ in. gas piping.

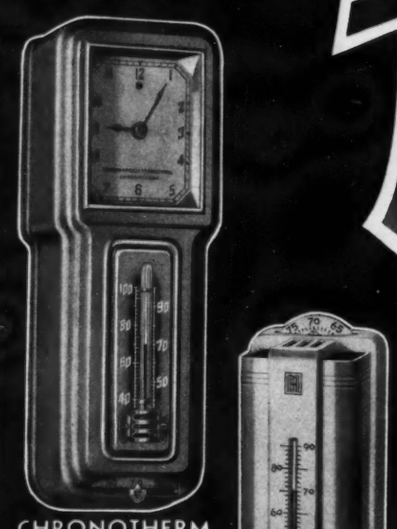


SECTION	MAX. LOAD	SIZE PIPE
A-B	165 CF	1¼"
B-C	145 "	1¼"
C-D	125 "	1¼"
D-E	105 "	1"
E-F	35 "	¾"
B-G	20 "	¾"
C-H	20 "	¾"
D-I	20 "	¾"
E-J	70 "	1"

FIG. I. Examples of gas house pipe design., Los Angeles Gas and Electric Corp., Gas Distribution Dept.

Save Heat

WHEN IT'S NOT Needed



AT NIGHT, or during periods when buildings are not occupied, it is unnecessary to maintain temperature at the daytime level. Every degree that temperature is lowered reduces fuel consumption 3.2 percent. The Chronotherm automatically lowers temperature at night and restores it in the morning, maintaining leveled heat at all times. The Time-O-Stat maintains lowered night temperature and automatically restores temperature to the daytime level after being set, with a mere twist of the fingers. The Time-O-Stat can be used with the heat leveling Acratherm, or with any other Minneapolis-Honeywell non-clock Thermostat. Minneapolis-Honeywell Regulator Co., 401 East 28th Street, Minneapolis, Minn.

Dependable Controls Cost Less Than Service

MINNEAPOLIS-HONEYWELL

Control Systems

BROWN INDUSTRIAL INSTRUMENTS for INDICATING, RECORDING, CONTROLLING

Equation (6) may be stated in words as follows:

RULE: Multiply the quantity of gas to be delivered by the length of the pipe increased by 100 feet. Select the pipe size in the table above, corresponding to this product, or the next higher value.

The deviation of equation (6) from calculated values according to the Spitzglass Flow Formula is relatively great for very short lengths of pipe, although on the side of safety and leading to a design of excess capacity. Similarly, for very long lengths—that is, long lengths with reference to house piping design—the error again becomes large but again is on the side of safety. Only in the most unusual instances will the error introduced by the use of this approximation be of serious magnitude.

The layout shown as Fig. 1 is presented in order to demonstrate the apulication of equation (6) to a problem in gas house piping design.

Unaccounted-for Reduced by Control of Pressure on Birmingham System

● **B. H. ELLIOTT, Birmingham (Ala.) Gas Co.; addressing Southern Gas Association 1936 annual convention, New Orleans, La.—(Abstract by G A S).**

THE gas distribution system of Birmingham, Alabama, using both high and low pressure mains, extends up and down a valley for a distance of 22 miles and spreads across the mountains into valleys on either side.

High pressure feeders receive their principal supply from large boosters located at a 5-million cubic foot holder in North Birmingham but are also connected to compressors, originally installed, at the city holder.

During the winter and spring of 1933 the annual unaccounted for figures began to increase. The company had been, and was, actively engaged in locating and repairing leaks, removing old age meters, checking dead services and searching for irregular connections and meters which had been damaged or tampered with. These efforts all helped, yet the unaccounted for continued high.

The system is well supplied with permanent pressure gauges located at the extreme ends or low points, and at holder stations and district regulators; also with temporary gauges placed at certain immediate points on the high pressure feeders. Daily records were obtained during several summer and winter months, and from a study of these charts the annual average pressure on the system was found to be 3.5 pounds. It was also found that the annual average pressure on four branch feeders was 4.2 pounds. These four branch feeders represent 118 miles of 3-inch equivalent or 28 per cent of the total high pressure system.

In the early fall of 1933 regulators were placed at the head of these branch feeders, installed in concrete pits dug in unpaved areas between the curb and sidewalk, and set to deliver 2 pounds.

These steps were followed in November, 1933, by the installation of a distance recorder, located at the North Birmingham booster station, both indicating and recording the pressures at the end of mains in the valley south of the city, the lowest point on the system during the winter months. After studying the various drops in pressure between these two points during different load conditions, the necessary booster station pressures were determined to prevent the pressure at the end of the line from falling below 1 pound. This study also disclosed that during about 16 hours of the day, by holding pressure to 1 pound at this point, sufficient pressures were maintained throughout the entire system.

The following spring, with the reduced pressures carried, the low point shifted to the extreme west end of the system. This was easily cared for by the operation of one small compressor at the city holder for short periods of the day. During the summer months, by partially closing a valve in the main feeder, south, to prevent pressure from going too high, all pumping may be handled from the North Birmingham station. By watching pressures carried during 24 hours of the day and seeing that they are kept sufficient but not allowing them to go higher than is necessary to maintain good service, the leakage has been materially reduced and, as a result, the system's annual average pressure has been reduced 2 pounds while the annual average pressure on the four branch feeders has been reduced 3 pounds.

During a period of 26 months, since the installation of the four regulators, the annual unaccounted-for has been reduced 170 million cubic feet; 40 million cubic feet of this is estimated as theft gas. The balance of 130 million cubic feet is due, it is believed, to reduced leakage by pressure control.

Grand Rapids Co. Organizes House Heating Department

A RECENT innovation with the Grand Rapids Gas Light Co. was the organization of a department for the sales and installation of house heating equipment under the management of Russell Harris. Bernard T. Franck, coordinator of sales, American Light & Traction Co., is acting sales manager at Grand Rapids with L. H. Verschoor as his assistant.

RUSSELL HARRIS

The new department is manned by 30 salesmen, each responsible for a protected territory. Sales activities are promoted primarily by newspaper advertising. Since the organization of the department, statistics show average sales of almost a burner per day per man, and Manager Harris expects the department to exceed by a large margin the yearly quota of 1500 house heating installations. Standard price for burners is $149.50. The company is selling straight natural gas at a house heating rate of 50 cents per M c.f.

■ ■

"California Tales" Broadcast Inaugurated by P. G. and E.

PACIFIC GAS AND ELCTRIC CO. on October 8 inaugurated its first radio broadcast feature. Programs will concern the Pacific Gas and Electric Co. and the services that it renders to the public. Both gas and electric service will be touched upon.

The broadcast will be given under the title "California Tales" and each week will present a dramatized story of a human interest incident in the life of a different Northern or Central California community. The broadcast will be presented on Thursday night of each week beginning October 8 at 8:30 o'clock over KGO.

As a feature, prizes will be offered in each community for the best story pertaining to that particular community, all stories to be submitted to a local committee which will pick the one that has the most authenticity and popular and dramatic appeal. Each broadcast will be dedicated to the particular community that is the setting of the story.

Prizes will consist of gas and electric appliances, the winner to have a choice between several appliances.

The dramatizing of the stories is to be in the hands of Samuel Dixon, one of the most widely known radio playwrights of the coast.

■ ■

Baker Joins Central Illinois

Clement C. Baker, formerly connected with the Joplin Gas Co., Joplin, Mo., has been appointed manager of the Industrial and Commercial department of the Central Illinois Public Service Co., Quincy, Ill. For a number of years prior to his connection with the Joplin Co., Mr. Baker was affiliated with the Oklahoma Natural Gas Co. at Tulsa and Ardmore.

UNIVERSAL IS READY!

See the New 1937 Universal Gas Ranges
on Exhibit at the Atlantic City Convention.

Booths 416 and 417

UNIVERSAL *Gas Ranges*

MANUFACTURED BY CRIBBEN & SEXTON COMPANY, 700 N. SACRAMENTO BLVD., CHICAGO, ILLINOIS

BERNARD W. LYNCH

ROBERT J. GRAF

J. H. BRIGGS

Byllesby E. & M. Corp. Changes Name; Lynch Succeeds O'Brien as President

THE board of directors of Byllesby Engineering and Management Corp. Sept. 16 voted to change the name of the organization to Public Utility Service Corp., and elected B. W. Lynch as president of the new corporation succeeding John J. O'Brien, former president of the Byllesby Corp., who died on August 7. Mr. Lynch is also president of Standard Gas and Electric Co.

Mr. Lynch, who is 52 years old and a resident of Chicago, joined the Byllesby organization in 1905 as auditor. He was later associated in an official capacity with operating utility companies in various parts of the country. He became general auditor of Standard Gas and Electric Co. in 1914; in 1923, director and vice president; in 1928, chairman of the finance committee.

Byllesby Engineering and Management Corp. was organized in 1919, to render engineering and managerial services to public utility and other companies, but particularly for those companies comprising the Standard Gas and Electric Co. system. In September, 1935, the stock of the management corporation was sold without profit to these companies by Standard Gas and Electric Co. and the corporation then functioned as a service organization on a cost basis to the companies acquiring it. The purpose of the change in name from Byllesby Engineering and Management Corp. to Public Utility Service Corp. is to more clearly indicate existence of Public Utility Service Corp. as a separate and distinct organization from H. M. Byllesby & Co., the investment banking house.

Members of the board of directors of Public Utility Service Corp. consist of the presidents of the operating companies (who were elected at the time these companies acquired Byllesby Engineering and Management Corp. last year) as follows: F. R. Phillips, president, Philadelphia Co., Pittsburgh; R. F. Pack, president, Northern States Power Co., Minneapolis; J. F. Owens, president, Oklahoma Gas and Electric Co., Oklahoma City; T. B. Wilson, president, Louisville Gas and Electric Co., Louisville; J. P. Pulliam, president, Wisconsin Public Service Corp., Milwaukee; C. M. Brewer, president, The California Oregon Power Co. and Mountain State Power Co., Medford, Oregon; W. F. Raber, president, San Diego Consolidated Gas and Electric Co., San Diego; W. N. Clark, president, Southern Colorado Power Co., Pueblo, and B. W. Lynch, R. J. Graf, M. A. Morrison and H. C. Cummins, all of Chicago.

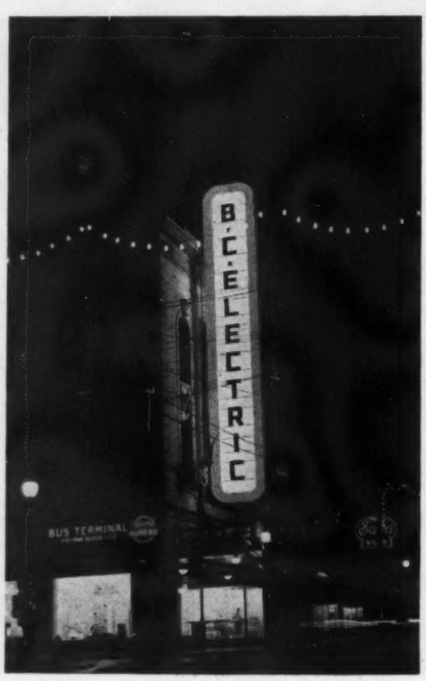
Robert J. Graf, of Chicago, was elected president of H. M. Byllesby & Co., succeeding the late John J. O'Brien. Mr. Graf, who was one of the original partners in the Byllesby Co. when it was founded in 1902, has been first vice-president since 1924. Joseph H. Briggs was elected chairman of the executive committee of H. M. Byllesby Co. Mr. Briggs joined the company in 1909, becoming manager of the bond department in 1919. He has been a vice-president and director since 1923.

■ ■

B. C. Electric Develops Novel Neon Sign

AN unusual display development of the B. C. Electric Railway Co. is a new combination street sign of Neon and lamp erected at its largest appliance store, Granville and Dunsmuir streets, Vancouver, B. C.

In seeking a contrast with surrounding electrical displays, it was decided to depart from the usual run of Neon signs, and an effort was made to obtain dark letters on a brilliant background instead of illuminated letters on a dark background. This effect was obtained through the use of concealed lamps and with Neon tubing under metal letters. The background illumination is alternately white and blue. Surrounding the sign are five concentric rows of visible Neon tubes, giving a modernistic effect.



Design for the new sign originated in the power company's own publicity department, the Neon Products Co. working out the details.

■ ■

Seven Western Companies Join Mystery Chef

SEVEN Pacific Coast gas companies serving more than 900,000 domestic meters joined the Mystery Chef radio program for a period of 13 weeks starting Wednesday, September 2. These companies are the Southern California Gas Co., Southern Counties Gas Co., and Los Angeles Gas and Electric Corp., all in Los Angeles; Seattle Gas Company, Seattle, Wash.; Portland Gas and Coke Co., Portland, Ore.; the Mountain Fuel Supply Co., Salt Lake City, Utah, and the Washington Gas and Electric Co., Tacoma,

The program will originate in the New York studios of the National Broadcasting Co. with the Mystery Chef at the microphone, and will be carried to the Coast by transcontinental telephone. Two 15-minute broadcasts will be made a week, on Wednesday and Friday, 12:45 to 1:00 p.m., bringing the program to the Coast at 9:45 to 10:00 a.m. The following Red Network stations will be used: KDYL, Salt Lake City; KFI, Los Angeles; KGW, Portland; and KOMO, Seattle.

With the addition of the Pacific Coast companies there are now entered in the Mystery Chef program companies having 6,850,000 domestic gas meters in service. This is 45 per cent of all domestic meters in use.

A change in time of broadcasting the program to companies in the East went into effect on September 16 and will continue for 11 weeks until November 27. The program now goes on the air Tuesday and Saturday mornings at 11:30 to 11:45.

Distribution of the recipe book entitled "Be an Artist at the Gas Range" during the first nine months of the program has been 822,000 copies.

■ ■

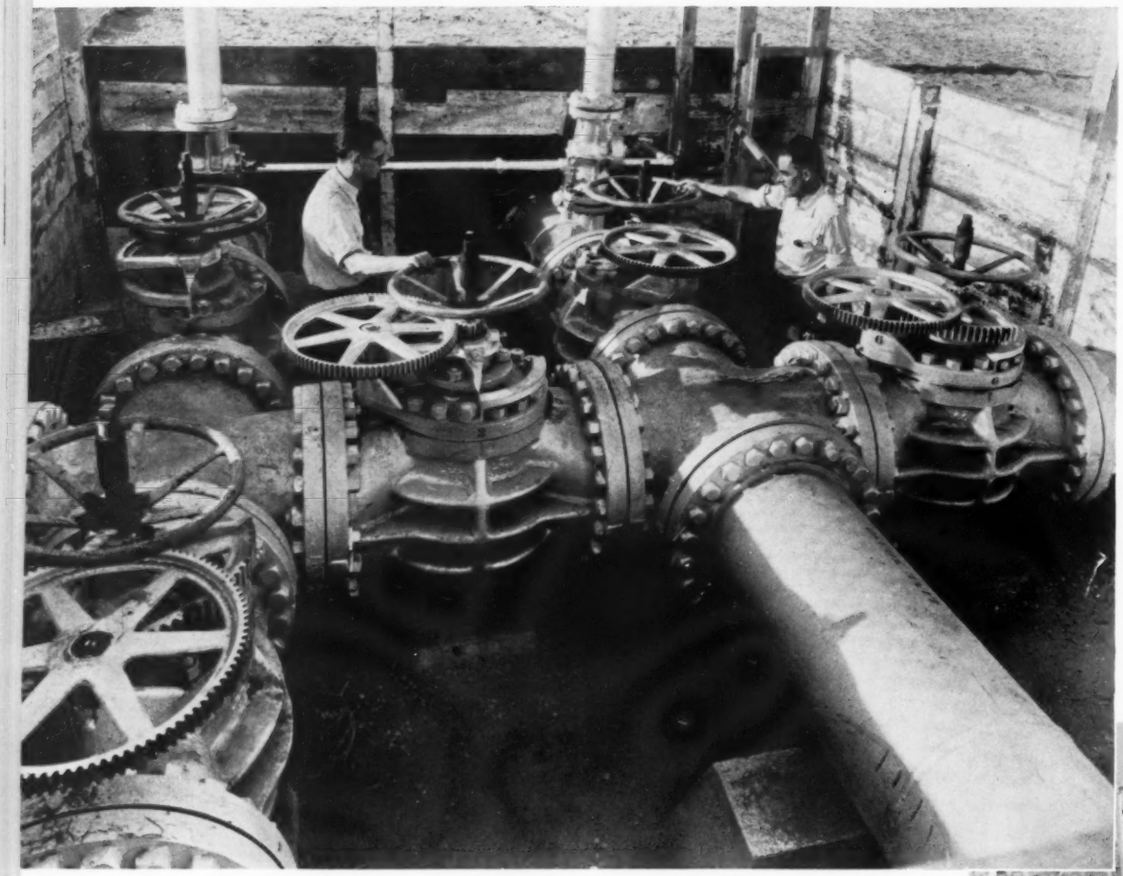
Briefs Filed in N. Y. Court in Utility Act Test Case

FILING briefs with Judge Julian W. Mack in the Federal Court in New York City on September 14, the Electric Bond and Share System and the Securities and Exchange Commission started suit to test the constitutionality of the holding company provisions in the Public Utility Act of 1935.

Controversy centers about Electric Bond and Shares' unwillingness to comply with section 4 (A) of the act, which restricts the activities of utilities in interstate commerce without registration, and with the utility company's refusal to register with the Securities and Exchange Commission as required in Section 5. The company's refusal to register is based on the grounds that the act is unconstitutional and that by registering it would sustain injury.

"No need to check these valves sir; you know they're Nordstroms"

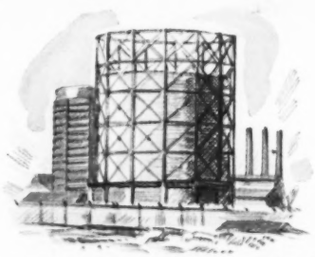
THE PERFECT APPLICATION OF A PRINCIPLE



ONLY **NORDSTROMS** MEET EVERY MAJOR VALVE NEED

View to left shows Nordstrom Valves on main input manifold of a natural gas transmission line. Lower view shows 4" Nordstrom Valves and Emco Meter on gas line connecting digester to storage tank in a sewage plant.

FAITHFUL VALVE PERFORMANCE REQUIRES NO "WATCH-DOG"



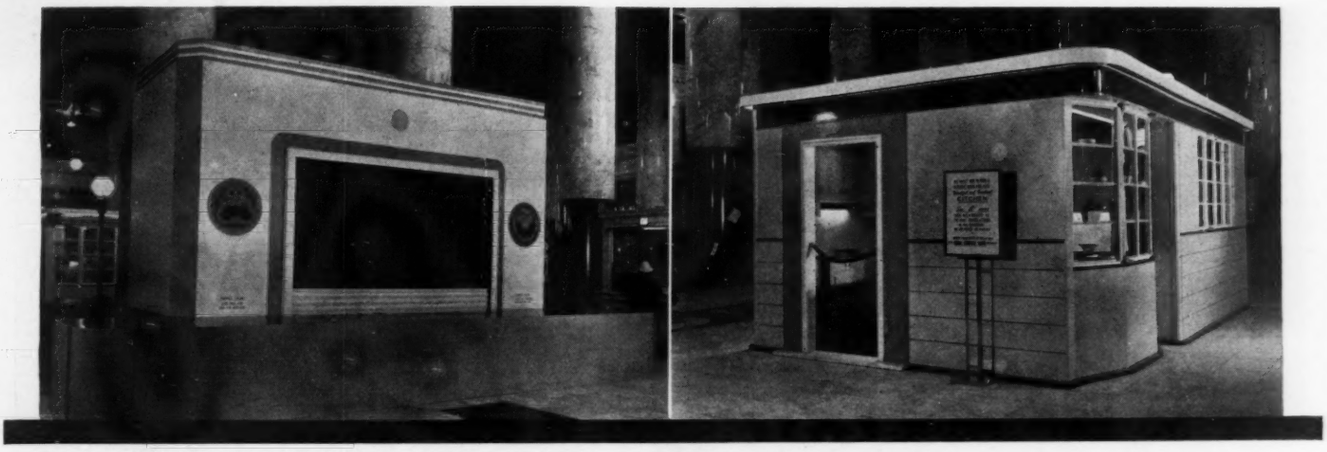
Safety is the first rule in any gas-handling operation. A leaking valve is a hazard that cannot be tolerated. Nordstrom Valves add safety. They do not require constant attention. "Sealdport" lubrication assures a tight seal.

MERCO NORDSTROM VALVE CO.
a subsidiary of
PITTSBURGH EQUITABLE METER CO.
Main Offices: Pittsburgh, Penna. Branch Offices: New York City, Buffalo, Philadelphia, Columbia, Memphis, Atlanta, Chicago, Kansas City, Tulsa, Houston, Los Angeles and Oakland.

NORDSTROM VALVES

LUBRICATED PLUG

PATENTED "SEALDPORT" LUBRICATION



PUPPET PLAYERS: Unique feature of the "Open House" was a gas industry drama played by puppets every half hour during the show on the stage at left. KITCHEN CONTEST: Valuable prizes provided visitors with an incentive for great imagination in the contest to name the Model Kitchen shown at right.

Peoples Gas Light "Open House" Attracts Record Crowd

"WE take pleasure in asking you and your friends to our 'Open House' and 'Heating and Air Conditioning Show', held from August 3rd to September 4th," said The Peoples Gas Light & Coke Co. to its consumers. Some 125,000 people responded to the invitation.

Attendance records show that 64,321 persons passed through "America's Finest Kitchen" and 21,342 visited the Heating and Air-Conditioning Show featured in the Home Service Auditorium located in the basement.

Other features of the show, in addition to the Model Kitchen and Heating and Air-Conditioning exhibit, were the new Home Service Kitchen constructed in the sales room, the Nautical Basement also erected on the main sales floor, special exhibits of appliances, a daily fashion review, and a puppet show.

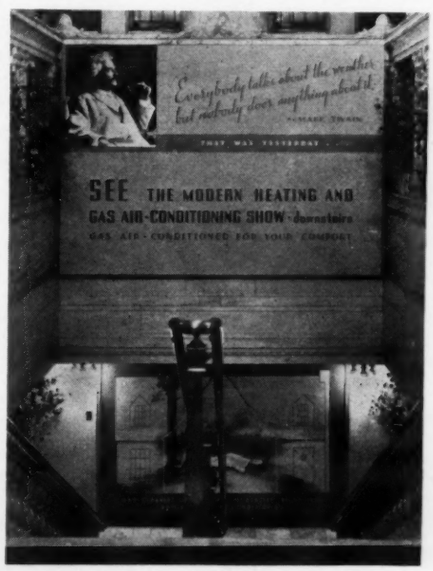
America's Finest Kitchen located in the center of the main floor lobby was designed by the Kitchen and Basement Planning Bureau of the company, with Harry Swenson as director, and proved especially attractive to women visitors. All visitors were invited to enter a contest to name the kitchen, with valuable prizes being awarded for the seven best names suggested: (1) 7-foot Electrolux gas refrigerator, (2) 4-foot Electrolux gas refrigerator, (3) 6-Burner Roper Gas Range, (4) Moore "Guardian" gas range, (5) Detroit-Jewel gas range, (6) Magic Chef gas range, (7) Crane Automatic gas water heater. Next 10 prizes were Princess Coffee Makers; the next 25, Sealsacs. Five other prizes were awarded for the best 12-word slogans on Home Comfort.

The Heating and Air-Conditioning Show featured the exhibits of The American Foundry and Furnace Co., Air Conditioning Corp., Mueller Furnace Co., Surface Combustion Corp., American Gas Products Corp., American Radiator Co., Bryant Air Conditioning Corp., Crane Co., James B. Clow & Sons, General Gas Light Co., National Radiator Corp., Forest City Foundries Co., The Moore Corp., and the Autogas Corp., each manufacturer displayed the latest heating and air-conditioning equipment.

Heating engineers of the gas company conducted the visitors through the various exhibits, manufacturers representatives being called into service only when special delegations such as architects, steamfitters, etc., visited the show at designated times. The engineers laid special emphasis on the elements of warming, humidifying, cleaning and circulating air in winter, and cooling, dehumidifying, cleaning and circulating in summer.

A "Mystery House Heating" Guessing contest brought visitors face to face with the low cost of heating a home with gas. Pictures of representative Chicago homes heated with gas were posted in this contest, with every picture but one showing the actual cost of heating the home during the past winter. The contestants were asked to supply the cost figure for heating a five-room bungalow.

Frappe and cookies were served all guests visiting the Heating and Air-Conditioning show. Visitors also had a sample of modern air-conditioning with the auditorium having been newly air-conditioned for the show. A new Home Service Kitchen erected on the appliance sales floor, adjoining the customer's lobby, accounted for many visitors to this section. Recipes were given out from this kitchen and special foods were usually being prepared before the eyes of the visitors.


Everybody talks about the weather but nobody does anything about it.
SEE THE MODERN HEATING AND
GAS AIR-CONDITIONING SHOW downstairs

Air conditioning displays furnished a practical education on the subject of weather control.

In addition to its display of modern appliances, a Nautical Basement exhibited on the sales floor received special interest. The basement, built to resemble the interior of a boat's cabin, was complete with steamer chairs, a bunk seat and port holes. A window in the basement brought to view a realistic scene of water craft lying at anchor in a harbor.

Gowns, cloaks and furs featured in the style show were displayed in the Nautical Basement. The entire wardrobe was given as a prize for the best letter written about the style show.

At 2:30 every afternoon except Saturday a style show was staged from the platform erected opposite the model kitchen. Eighteen professional models displayed the latest fall styles in women's wearing apparel during this 40-minute show.

The puppet show was given every half-hour from 12:30 to 4:30 each afternoon, being featured from a stage located on the main floor. From 40 to 200 people attended the show at each of its 179 performances. The script of the sound playlet used in the puppet show was written by Ray Fenton of the company advertising department. The voices of members of the Peoples Gas Dramatic Group were recorded for the playlet with the puppet show proper being conducted by professionals.

Advertising promotion for the show included newspaper space, window displays, bill enclosures, the Gas Gazette, official medium of the Home Service department, and radio announcements. Letters of invitation were also sent out to such special groups as the Heating and Ventilating Society, Organization of Steam Fitters, members of the Architects organization, and to manufacturers of gas equipment. Special showings were conducted for some of these groups. Letters were also sent to all women who had been

served in previous years by the Kitchen and Basement Planning Bureau as well as to a mailing list of the Home Service department.

An "Open House" night for employees and their families officially opened the show. Music, dancing and special entertainment was provided for this occasion. Fifty-five personality girls elected from the ranks of the company's employees served as hostesses during the show. Two of the girls were on duty each afternoon to assist in handling the thousands of visitors.

The results of the show, including the widespread interest evidenced not only by the attendance of our customers but also by their participation in the various contests, have far exceeded the company's expectations, according to F. X. Mettenet, vice-president in charge of sales.

National Advertising in Second Month

ABOVE is reproduced the gas industry national campaign advertisement advertisement entitled, "Pastry Triumphs Every Time," will appear in Good Housekeeping, McCall's, and American Home during November, and in the Ladies' Home which will appear in the October 10th issue of the Saturday Evening Post. A full page Journal and the Woman's Home Companion in December.

Issued by the Committee to Conduct National Advertising to all participating gas companies last month was bulletin No. 5, a portfolio containing ready-to-use publicity for insertion in local newspapers as tie-in material with the national campaign.

Gas Refrigeration Shows Rise

Pacific Gas and Electric Co. reports a notable trend toward greater acceptance of gas refrigeration in Northern California during the present season. To date this year installations in this territory exceed last year's by about 85 per cent.

Gas Company Changes Name

The Alabama Utilities Service Co., Alabama City, Ala., has filed an amendment to its certificate of incorporation to change the name of the company to Alabama Gas Co., according to an announcement by W. W. Winter, president of the company.

T. E. Roach Named President of Washington Company

T. E. Roach, for several years vice-president and general manager of the Washington Gas and Electric Co., Tacoma, Washington, was elected president of the company September 11, according to an announcement from the company's board of directors. With his new office Mr. Roach assumes the presidency of three affiliated companies, the Southern Power Co., Cedar City, Utah; the Dominion Electric Power, Ltd., of Estevan, Saskatchewan, Canada, and the Oregon Gas and Electric Co., Veronia, Ore.

T. E. ROACH

Prior to his connection with the Tacoma company, Mr. Roach was sales manager and vice-president of the National Electric Power Co. of New York.

■ ■

Spokane Co. Offers Free Gas To Range Purchasers

TO offset local electric competition in which the power company and dealers offered $25.00 for old gas ranges as a trade-in allowance on new electric ranges, the Spokane Gas & Fuel Co., Spokane, Wn., offered a special inducement to gas range purchasers of the first month's gas bill free, according to Ray G. Penning of the sales department of the Spokane company.

The offer, which was open during a two-months sales period, not only successfully withstood the electric competition, but was a definite factor in closing range sales, as the campaign resulted in the sale of 48 new ranges as against 22 for a similar period last year.

Cost of this sales inducement was small, as the free gas was charged off at holder cost before being set up in the books at the regular rate, thus eliminating charge-offs.

■ ■

Karen Fladoes in Peoples Gas Home Service Post

KAREN FLADOES, nationally known home service expert, has been appointed director of Home Service for the Peoples Gas Light and Coke Co., Chicago, according to an announcement by F. X. Mettenet, vice-president in charge of sales. Miss Fladoes replaces Mrs. Anna J. Peterson, retiring because of ill health. Mrs. Peterson will continue to act in an advisory capacity.

Miss Fladoes is a graduate of Stout Institute, supplementing her education with post-graduate work at Columbia University. For four years she was organizer of cooking schools for the Washburn Crosby Co., and during the past nine years has been home service director for the Equitable Gas Co. of Pittsburgh, where during the past eight years her home service broadcasts attracted a large radio audience.

SPACE FOR SALE

. . . YOUR *Biggest* SELLING FEATURE FOR THE *Small Home Market*

Every foot of basement space is usable with the "Empire" Ideal Gas Boiler by AGP and "Empire" jacket for AGP Gas Water Heaters.

AGP EQUIPMENT FOR SMALL HOMES
builds profitable loads in this year's biggest home market

"Small homes" are going up by thousands throughout the country. Low gas house heating rates coupled with reasonably priced Ideal Gas Boilers make it possible for you to enter this great new market. Present these facts to Mr. Homeowner:

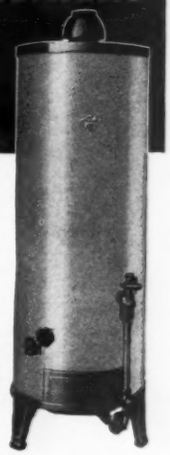
1. *AGP equipment is handsome, efficient, compact and well priced.*
2. *The "Empire" boiler has no unsightly exposed piping. Chimney connections concealed at back on some models.*
3. *No heater room necessary. Saves expensive partitions and unsightly jogs.*

Architects, builders and home owners appreciate these advantages where space is at a premium. For the home without a basement, sell the "Empire" Ideal series GA-E. It is made for installation on the same floor as the living quarters.

Ideal Gas Boilers come also in the Standard Model. There is a size and type for every home and every industrial use. Posters, booklets, direct mail, and other selling helps are ready now to help you sell. Write today for complete details.

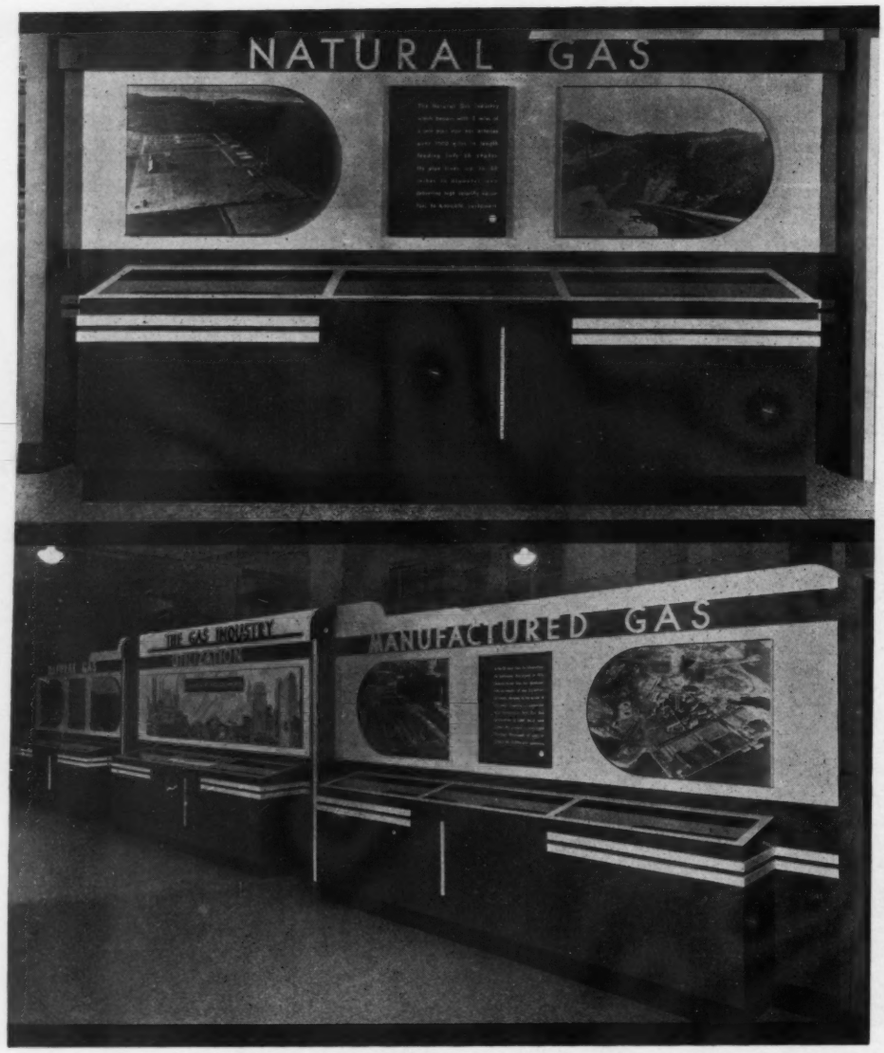
AMERICAN GAS PRODUCTS CORPORATION
DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION
40 WEST 40TH STREET · NEW YORK, N.Y.

AGP
automatic, gas-fired STORAGE WATER HEATERS
for every home and purse.



Three types of AGP automatic gas-fired storage water heaters. Sizes from 15 to 75 gallons: tanks of galvanized steel or new rust-proof "Arcoloy" (strengthened copper).

THE "EMPIRE" IDEAL BY AGP
The World's most Beautiful Gas Boiler



Gas Industry Exhibits at Third World Power Conference.

World Power Conference Gas Exhibit Attracts 3200 Visitors Daily

THE gas industry's exhibit at the new National Museum, Washington, D.C., staged in connection with the Third World Power Conference, held in Washington, September 3 to 15, was visited daily by 3,200 people, according to word received from officials in charge of the Conference. The gas industry's exhibit was 40 feet long, 8 feet high, and occupied the most advantageous position in the Museum, in the center of the main hall, just inside the main entrance.

The exhibit portrayed both the natural and the manufactured gas industries, the center section being devoted to utilization. On a brilliant cobalt blue background, enlarged photographs, murals, and brief descriptions told the story of the production, distribution and utilization of gas.

Features of the exhibit were an enlarged aerial photograph of a pumping station, in Fritch, Texas, where natural gas from the numerous wells is drawn to a central point for long distance transmission, a photograph showing a natural gas pipeline winding its way over the California hills, an aerial view of the Hunts Point Plant of the Consolidated Edison Co. of New York, showing the water gas plant, the coke oven plant and the waterless holder, and a picture of the complicated pipe connections in a typical street intersection.

The utilization panel, a mural, was decked with small circular photographs, illustrating the manner in which gas is employed industrially, domestically and commercially.

Three photographs with description depicted the services rendered the industry by the A.G.A. Testing Laboratories at Cleveland, Ohio. Illustrations of gas appliances were shown on accompanying panels.

Another feature was a map of the United States showing pipelines and pumping stations of the natural gas transmission system, on either side of which were given the statistics of the natural gas industry.

All of these cabinet panels were glass transparencies, the photographs in positive and the text in negative, illuminated from below. The exhibit was fabricated of plywood, designed, produced and assembled in the Display Advertising Studio of the Consolidated Edison Co. of New York.

■ ■

Sale of L. A. G. and E. Electric Properties to go to Vote

ON December 8 a special election will be held by the voters of Los Angeles to determine upon passage of a charter amendment which would result in sale of Los Angeles Gas and Electric Corp.'s electric properties to the city, and affect the gas interests of Southern California in several other important respects. If passed the charter amendment will do the following:

(1) Confer an option, expiring September 30, 1939, upon the city, to purchase the L. A. G. and E. electric properties for the sum of $46,340,000.

(2) Grant a 35-year franchise to supply gas for heat and power, to the Los Angeles Gas and Electric Corp., Southern California Gas Co. and Southern Counties Gas Co., distributors of gas within the city boundaries.

(3) Set $505,000 as the sum to be paid the city by above companies for their prior use of the city streets.

If approved and consummated, these provisions will bring to an end litigation and negotiations of several years' standing. The Municipal Bureau of Power and Light, Department of Water and Power, will offer for sale revenue bonds in the amount of $46,340,000, the proceeds of which will be used to pay for the properties. The Los Angeles Gas and Electric Corp. will utilize this money to retire $40,000,000 of outstanding bonds. Under the terms of the trust indenture under which the bonds were issued and sold the corporation must pay a premium of 5 per cent, or $2,000,000 over and above the principal amount. Therefore $42,000,000 of the total price to be received from the city must be utilized for this bond retirement.

Mr. Addison B. Day, president and general manager of the Los Angeles Gas and Electric Corp., has given the following statement to the press:

"While the Los Angeles Gas and Electric Corp. is reluctant to part with its electric system that it has owned and operated for over 50 years, this company, and Southern California Gas Co. and Southern Counties Gas Co., which serve the city of Los Angeles, feel that it is to the advantage of all concerned that, instead of a continuance probably for many years of pending litigation, all matters in controversy should be amicably settled.

"We are all, therefore, willing to carry out the plan contemplated in the suggested charter amendment."

■ ■

P. G. and E. Promotes Aiken

Douglas Aiken, crew captain in the San Francisco division of Pacific Gas and Electric Co. Sales Department has been promoted to division sales manager of the Shasta division, with offices at Red Bluff.

Announcing
THE GREATEST CIRCULATING HEATER EVER USED IN A GAS RANGE

WEDGEWOOD marches on!

and carries the banner for GAS!

●WEDGEWOOD'S new Table Top models with Gas Circulating Heater* will *sell*—and they'll sell more *gas*. Exclusive advantages of this new Wedgewood Heater: automatic safety lighter—Gas Heating Unit full porcelain enameled—a design that provides the utmost heat for amount of gas consumed. *PATENT APPLIED FOR

Table Top Range

●SHOWN BELOW is a cross section of Wedgewood's All-Season Masterpiece No. 2022 BK CT. For the *first time* your customer gets a perfected Gas Circulating Heater plus a full-size firebox. Note the construction that provides for greater intake of cold air—both from the bottom and through the lower grate.

2022 BK CT. Table Top Kitchen Heater Range

●WEDGEWOOD'S All-Season Masterpiece Models No. 2045 CT (Closed Top) and No. 2085 OT (Open Top) shown above, are equipped with Gas Circulating Heaters. Clean, healthful, instantaneous kitchen warmth . . . and the same perfect cooking qualities that have made Wedgewood's Masterpiece Models the outstanding modern gas ranges!

A.G.A. Approved

WEDGEWOOD *The Modern Gas Range*

WINS FRIENDS FOR GAS

JAMES GRAHAM MANUFACTURING COMPANY · San Francisco · Los Angeles · Newark · Portland

VIEWS AT LEFT

(1) Parts of shield in knocked-down condition.

(2) Complete shield assembled.

(3) Final step in assembling shield around coupling on pipe. A boomer clamp keeps the shield in position preparatory to tightening up tie wires which hold the shield securely in place.

(4) Pouring pure coal tar pitch to fill the annular space between inside the shield and outside the coupling.

(5) Shield after it has been filled with compound.

(6) This view shows wooden strip placed over opening in shield to eliminate pressure applied directly to the compound by weight of back fill. In the lower right hand corner of views 4, 5 and 6 may be seen a 4-0 copper bond across the coupling.

Wooden Shields Used to Protect Dresser Couplings by Lone Star Gas Co.

By BRUCE CUNNINGHAM

Editor, Blue Blaze News, Lone Star Gas Co.*

A NEW method that insures longer life for Dresser couplings by affording greater protection from the detriments of corrosion was used by the Lone Star Gas Co. on its 20-inch line from the Long Lake and Cayuga fields in Anderson County to a point near Irving in Dallas County, Texas. This simple process, which aptly has been called the "mummification" method, employs a wooden shield that is filled with pure coal tar pitch after the shield has been applied to fit around the Dresser coupling. There is nothing new about the use of pitch as means for Dresser coupling protection, but Lone Star was the first pipe line company to use this type shield for dresser coupling protection.

Need for proper coupling protection has been recognized for some time and the requirements for such protection called for material that would be impervious to the action of water and corrosive soils. It was also necessary to have a material that would not become brittle after it hardened, so it would not become cracked even by the slightest movement of the pipe at the couplings due to contraction and expansion.

The material chosen for this protection was a pure coal tar pitch that sets fairly hard but retains a certain amount of resiliency and plasticity. The problem encountered in the use of the coupling material was to find a manner to apply it to the couplings and have a container for it which would prevent the material from being pushed off the couplings by weight of the dirt and rocks in the back fill.

Containers for this material were suggested by a pipe line enamel manufacturer and built by a barrel factory. The containers were made of creosoted lumber to form the coupler shields which may be seen in the photos accompanying this article.

The method of placing the shield around the Dresser coupling is simple. The shield is set around the coupling and made tight by tie wires. A boomer clamp holds the shield in place while the wires are being installed. After the shield has been set around the coupling the cracks are filled with mud.

After the shield has been assembled around the coupling on the pipe line, it is filled with the special compound which is heated to 250° F. to make it fluid enough to pour. This covers the coupling parts, namely the middle ring, bolts, and followers, with a coating approximately 1 inch thick, which embalms or mummifies the whole coupling so corrosive substances in the soil cannot get in contact with the metal coupling. After the shield has been filled with the compound a wooden strip is placed over the opening provided in the shield, through which the compound is poured, to eliminate pressure applied directly to the compound by weight of the back fill.

A number of engineers from other pipe line companies made inspections of the process during installations. They showed great interest and expressed belief that the protection given the coupling by this method surely would be permanent and answer a long sought need.

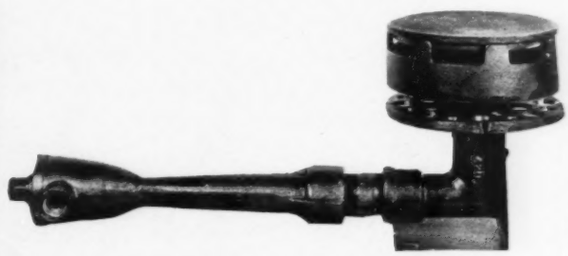
The pipe itself was covered with a hot coat of enamel and wrapped with an asbestos felt wrapping for protection against soil corrosion.

* This article appeared originally in "Blue Blaze News," house organ of the Lone Star Gas Co.

N. G. E.
CONVERSION BURNERS
For Application to All Commercial Heating Installations

Utility and Appliance Men: Write For Our Valuable Commercial Heating Bulletin

Series 400: For small cast iron or steel rectangular fire box boilers. Occupies little head room. High capacity. Easily manifolded. Operates quietly at all rates of firing without vibration.



No. 73-10: For installation in small round furnaces (warm air, hot water, steam) and vertical burners, kettles, etc. Utilizes refractories for maximum heat liberation. Low in price, yet highly efficient.

Type R: Solves conversion requirements for round furnaces. Full manifolding flexibility. Maximum fuel economy, lowest maintenance costs are assured. Requires little or no attention after installatoin.

Type W: The ideal upshot burner for square or rectangular furnaces. Installed with minimum alterations to fire box. Easily manifolded.

Type 313: Designed particularly for vertically firing Birchfield, Pacific, Kawanee and similar steel boilers. Utilizes refractory head.

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LOOK TO THE PIONEERS FOR CONTINUED LEADERSHIP

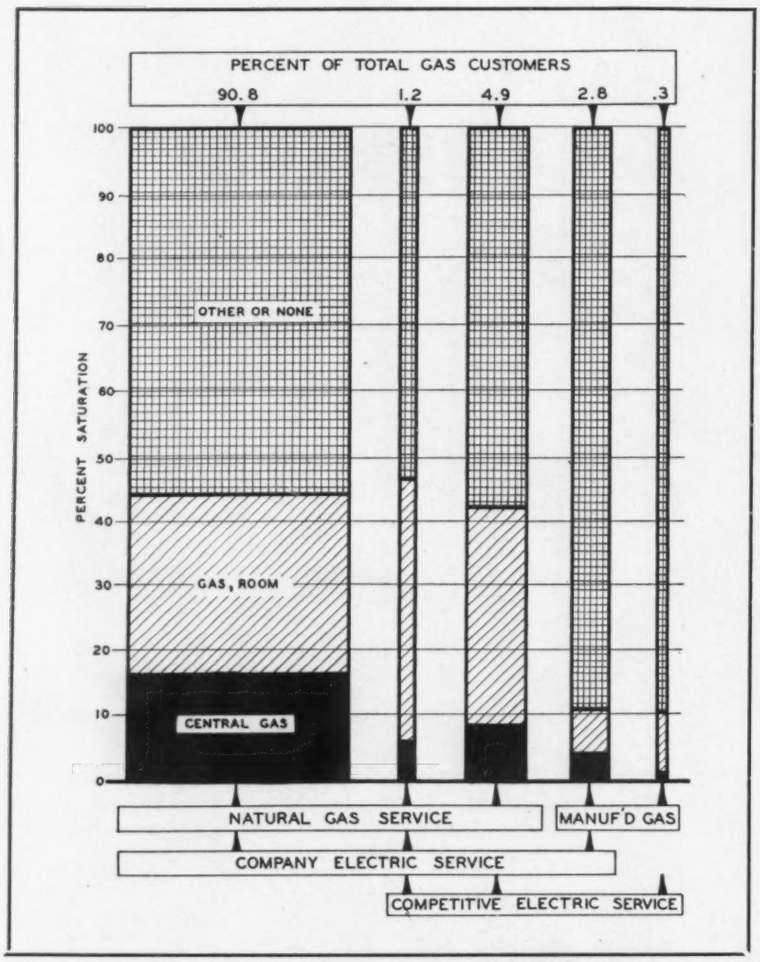


Fig. 6. House Heating Market—Types of Service Supplied.

Base The Sales Program Upon Facts

(Continued from Page 16)

All of which is of value in rate making studies as well as in sales planning.

Fig. 4 shows the market situation with respect to cooking. Each column represents a classification of service offered by the company as follows: The first column represents the area in which the company serves both natural gas and electricity. The second column the area in which the company serves natural gas and electricity and has electric competition. The third column where the company serves natural gas only, but has electric competition. The fourth column where the company serves manufactured gas and electricity and the fifth column where the company serves manufactured gas and has electric competition. The width of the column in each instance shows the relative importance of each classification insofar as the number of customers in the classification is concerned. In each classification, the percentage of saturation for each kind of equipment is shown by different types of cross-sectioning. Note the varying degree of saturation of gas ranges in these different service classifications.

Fig. 5 gives like information by the same classifications for the water heating market. The percentage of saturation is shown for automatic water heaters, non-automatic water heaters and those who have no water heaters or competitive fuel water heaters. You will note the degree of saturation of gas water heaters varies among the service classifications even more than does the cooking.

Fig. 6 gives similar information on the house heating market segregated as to central gas heating, individual room heaters, and those who use other than gas for heating or have no heating appliance at all. Here again the saturation changes materially as between classifications of service rendered.

The charts that are shown here are merely an example of one type of information that is secured from these "in the home" surveys. While these charts are broken down by types of service rendered by the company, the same kind of information is available for each different city and even down to the individual customer whose appliance situation is recorded on the survey card. In this way, we learn not only what the market possibilities are, what the need for our service is in each utilization process, but also the degree to which competitive equipment is being used, who is using it and what means are being used by competitive forces to further exploit the market.

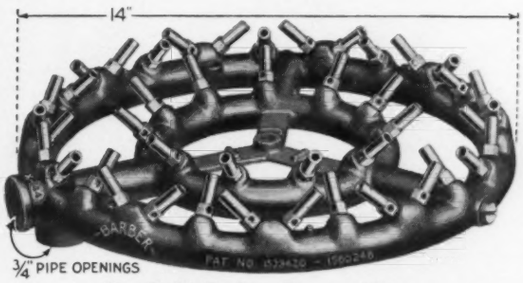
From the charts shown, it is apparent that a potential market for expansion of cooking and water heating among existing customers is relatively small insofar as percentage of the total is concerned. But since new business of this type requires a minimum investment of additional capital it must be remembered that where so many customers are involved, the securing of a relatively small increase percentage-wise, may actually represent a tremendous amount of profitable revenue. It is true that the heating market affords the greatest potential, but since gas sold for heating, especially in larger homes, goes for a relatively lower rate, contributes to higher peak demands and tends to pull down load factor, there are in some instances limits beyond which, business of this type cannot be profitably expanded. Generally speaking, we are led to the conclusion that cooking, water heating, and small types of heating equipment for installation in small homes are the most profitable business to go after. Of course, it has been argued that the people who do not have gas cooking or water heating equipment and a great many of those who use small coal or wood heating stoves to heat their houses are not in a position, either to buy the equipment they may be needing or to pay for its operation.

Some light is shed on this subject of ability to buy through a recent survey conducted by the United States Department of Commerce in the city of San Diego, which is a representative California city. The report on this survey, issued January, 1936, classifies all of the families in San Diego into annual income classes. It shows 17.4 per cent of the families in the $500 or less annual income group; 22.8 per cent in the $501 to $1,000

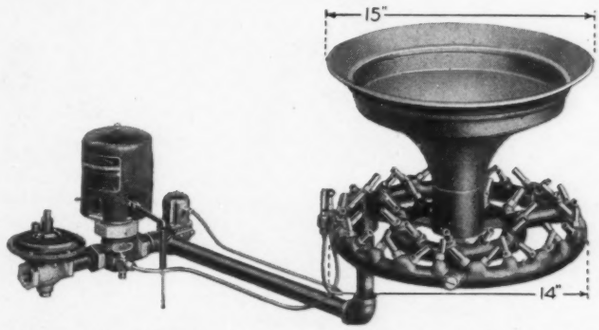
TABLE NO. 2—1936 DEALER SALES FORCE

Divisions	Number Dealers Major	Minor	Total	Wholesalers	Sales Manpower
Coast Valleys	11	44	55	0	132
Colgate	44	32	76	0	196
De Sabla	26	22	48	0	122
Drum	18	22	40	0	80
East Bay	83	198	281	33	1,092
Humboldt	16	18	34	0	80
North Bay	50	179	229	0	408
Sacramento	50	63	113	7	368
San Francisco	77	258	335	98	1,566
San Joaquin	87	32	119	1	418
San Jose	40	155	195	0	470
Shasta	20	14	34	0	68
Totals	522	1,037	1,559	139	5,000

BARBER BURNERS—*Presenting* NEW *Styles in* 2 ROUND BURNER *Models*

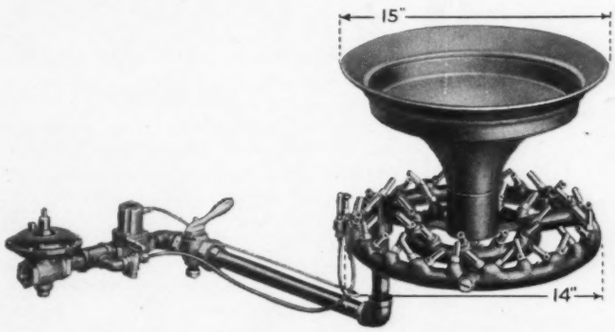


No. X-44 Barber Burner Unit



No. X-44-B. Barber Automatic Conversion Burner with Baltimore Safety Pilot Control

With Semi-steel Flame Deflector and Ring; Motor Gas Valve; Plain Room Thermostat; Baltimore Automatic Shut-off; Pilot Light; Butterfly Draft Door Assembly; Lower Baffles; Gas Pressure Regulator; Shut-off Valve, and 25 feet insulated wiring.



No. X-44-M. Barber Manual Control Burner with Baltimore Safety Pilot Control

With Semi-steel Flame Deflector and Ring; Baltimore Shut-off; Pilot Light; Lower Baffles; Gas Pressure Regulator, and A.G.A. Shut-off Valve with Union.

BARBER Conversion Burners, now as always, lead the field. As further evidence of this, Barber now presents NEW and greatly improved designs for *round* furnaces and boilers, with grates up to and including 20 inches in diameter.

We say without exaggeration that NO other Gas Conversion Burner can be *properly* installed in *less time* than these new Barber Burners. The reason is the *exclusive* construction features, found in no other burner.

These new assemblies can be supplied for completely automatic operation with Motor Gas Valve, or Magnetic Valve—or for Manual Control. Heat is deflected to sidewalls by a Semi-steel Deflector and Deflector Ring—a flame-scrubbing action that means high efficiency and economy. No refractory elements to replace.

Here, at last, is a *moderate* priced burner which has genuine merits not often found even in *higher-priced* competitive equipment.

●

Examine these new burners! Write at once for Illustrated Descriptive Bulletin and Price List.

●

See the Barber Burner Exhibit at the A.G.A. Convention in Atlantic City

THE BARBER GAS BURNER CO
3704 Superior Ave. Cleveland, Ohio

●

Address Michigan Inquiries to
The Barber Gas Burner Company of Michigan
4475 Cass Avenue Detroit, Michigan

BARBER *Automatic* JET GAS BURNERS

For Warm Air Furnaces, Steam & Hot Water Boilers, & Other Heating Appliances

group; 24.3 per cent in the $1,001 to $1,500 group; 17.5 per cent in the $1,501 to $2,000 group; 12.1 per cent in the $2,001 to $3,000 group; 4.6 per cent in the $3,001 to $5,000 group; and 1.3 per cent over $5,000.

This survey also showed that families having an annual income of $2,000 or less, use 57 per cent of the mechanical refrigerators, 77 per cent of the gas heating equipment, and 79 per cent of the automobiles. This information on automobiles is certainly interesting. Of course, the cars driven by the people in the lower income classes are not fancy in any respect and probably were not new when they were purchased, but at least they are transportation and they use gasoline and oil. This should indicate that people with relatively small incomes have the ability to buy. Of course, all of their wants cannot be satisfied. It is merely a question of what they want most, and our job is to make them want our services rather than something else. This is rather difficult in our business because a large number of these people are renters and they are not particularly inclined to stay put in one location. The United States Government recently made a real property inventory in the City of Sacramento which bears out this latter point. They found among other things, that of all the dwellings in Sacramento, 46 per cent were occupied by owners and 54 per cent by renters. Only 24 per cent of the renter-occupied dwellings had furnishings supplied by the landlord, or to put it another way, 41 per cent of all the dwellings were occupied by renters who supplied their own furnishings. It is probable that gas equipment was not considered furnishings in these inventories, but nevertheless, it would indicate that a goodly share of our unsold market involves renter-occupied residences. This same survey also gave information with respect to the duration of occupancy. Of the total occupied dwellings, 41 per cent of the occupants had lived in their present dwellings for over five years; 17 per cent from two to five years, and 42 per cent only 1 year or less. This survey was carefully made and should be significant. Since 41 per cent of the homes were occupied by renters who supply their own furnishings and since 42 per cent of the occupants had lived in the same location not more than one year, it is apparent that securing new revenue from this source requires very special consideration in the sales program.

We would indeed be remiss did we not at least mention business indices as having an important bearing in guiding the sales program. Especially is this true of new building, the rate of increase in population, and any special activities of an outstanding nature which are peculiar to any particular section of the territory being served.

Facts regarding this question are also essential:

What are the selling potentialities of our dealers already established in the field? How many are there—where are they located—what are they in a position to sell?

Our company keeps an active record of its dealer selling organization.

Table No. 2 shows, by territorial divisions, the extent of this selling force. In the system, there are 522 retail dealers of major selling importance and 1037 retailers of lesser individual sales importance. The total retailers are 1559 in number and these, together with 139 wholesale firms, have a total of 5000 sales people. The information we have for each dealer includes the following:

1. Name, address, phone.
2. Size of store.
3. Kind of business.
4. Number of outside salesmen.
5. Number of floor salesmen.
6. Names of firm and department management personnel.
7. Makes of appliances carried by types.
8. A monthly record of appliance sales.
9. Their attitude toward the company.

This information enables us to enlist the specific dealers who are in a position to do a good selling job with respect to any given type of appliance. We feel that it is the responsibility of the utility to furnish leadership to dealer people in their appliance sales activities, and the supplying of authentic market information is just one way in which it can be done. The importance of this is emphasized by the fact that dealers in P. G. and E.-served territory, sold six million dollars worth of gas appliances in 1935 and will sell more in 1936. This volume is exclusive of the direct sales made by our own salesmen who collect field information while doing their sales work and benefit in more sales as a result.

Our attempt in the preceding discussion has been merely to stress the importance of factual investigation in future sales work, with special attention to (1) The kind of business which is desirable; (2) Where it can be had, and (3) The size and ability of the sales force outside the company that can be harnessed.

To conclude, we are proceeding on the firm conviction that today's sales responsibility can be successfully fulfilled only by doing an intensive fact-finding and fact-using job to:

1. Improve customer relations.
2. Retain existing business in jeopardy to competition.
3. Check progress in each different sales objective undertaken, so as to continue on, stop, or change the procedure to better accomplish the purpose.
4. Know the cost for each phase of sales work undertaken.
5. Determine whether or not the expense is justified.

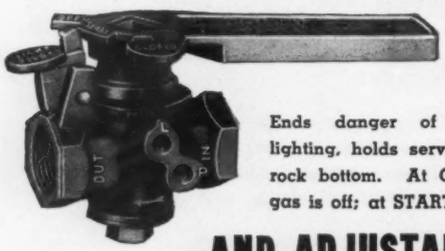
■ ■

Harry W. Fuller, Byllesby Vice-president, Passes

HARRY WILLAM FULLER, vice-president of the Byllesby Engineering and Management Corp. and of the Standard Gas and Electric Co., died unexpectedly last August 28, while on vacation at Basswood lake, near Ely, Minn. Mr. Fuller was 68 years old.

Born in New York City, Mr. Fuller entered the utility business in 1893 as an employee of the Consolidated Traction Co. of New Jersey. Later he served the Potomac Electric Power Co. and the Washington Railway and Electric Co. of Washington, D. C. He had been associated with the Byllesby interests since 1911.

SELL MORE HEATERS, BUILD LOAD AND CUT SERVICE COSTS 'WAY DOWN

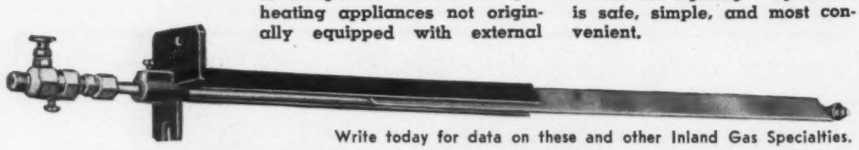


WITH THE INLAND SAFETY GAS COCK

Ends danger of blows in lighting, holds service costs at rock bottom. At CLOSED, all gas is off; at START, gas flows to pilot and lighter only; at OPEN, only pilot and burner are on. Locks in each position, automatically. Positive sequence.

AND ADJUSTABLE EXTERNAL LIGHTER

A companion device for gas heating appliances not originally equipped with external means for lighting. Operation is safe, simple, and most convenient.



Write today for data on these and other Inland Gas Specialties.

INLAND GAS SPECIALTIES

INLAND MANUFACTURING COMPANY

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DISTRIBUTORS: Los Angeles, Calif., Harry V. Payne — Atlanta, Ga., Clow Gasteam Heating Co. — Boston, Mass., Herbert H. Skinner — Dubuque, Iowa, A. Y. McDonald Mfg. Co. — Lakewood, Ohio, Harry L. Powers. Detroit, Mich., Peter Cheli, 5427 Grand River.

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A COMPLETE LINE of Gas Heating Appliances for Every Heating Need!

1 MODERN FORCED AIR HEATING AND VENTILATING

2 GRAVITY AND BLOWER BASEMENT FURNACES

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Pacific Thermolator

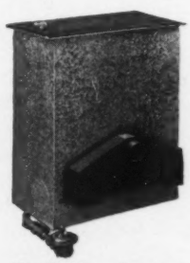
Gas Steam Radiator

Have You Received Your Copy of the Recent PACIFIC Sales Literature?

No Question About It . . .

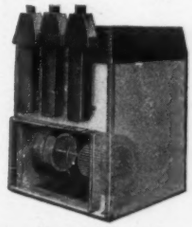
PACIFIC supplies the correct answer to ALL modern heating problems . . . . each appliance completely engineered from burner to vent connection . . . . designed for greatest utility, economy . . . . equipped with every modern device for increasing safety, convenience, reliability . . . . above all, "eye appeal" that commands instant admiration, respect, buying preference!

Get on the Profit-Side of Heating NOW! Write for Gas Appliance Catalog, G10.

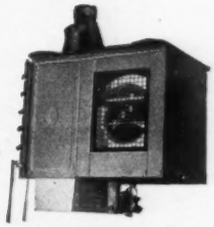


Pacific Floor Furnace

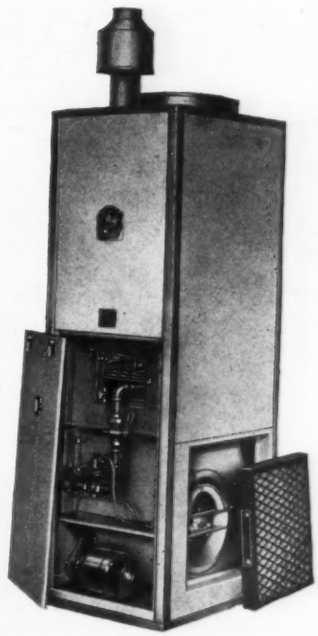
Gravity Furnace



Blower Furnace



Overhead Unit Heater



Pacific Forced Air Unit

Pacific Gas Radiator Co.

HUNTINGTON PARK, CALIFORNIA, U. S. A.

Oldest and Largest Manufacturers of Gas Heating Appliances in the West

PGR

SCIENCE AND ENGINEERING SKILL CREATED

GLO-FIRE

APPROVED ODORLESS GAS LOGS

ODORLESS
REALISTIC
ECONOMICAL
A.G.A. APPROVED

Equipped with slotted venturi type burner it assures fool proof operation. Approved also as an unvented appliance. Perfect combustion through preheated secondary air—A truly modern gas heating appliance.

WRITE TODAY FOR DETAILS
EXCLUSIVE DISTRIBUTORS

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AUTOMATIC
SHUT
OFF

THE *Accepted* SAFETY CONTROL FOR ALL PILOTED GAS BURNERS

● The New BASO, built on the thermoelectric principle, is rapidly pushing its way forward to No. 1 position in the field of automatic devices to prevent the escape of unburned gas.

It is now available on many gas furnaces, boilers, conversion burners, water heaters, ranges, etc., offered by this country's foremost appliance builders.

The flexible, easily bent leads from the thermocouple to the electromagnetic unit make easy the application to ANY appliance. Order a single unit and see how easily this Super Safe Shut-Off will answer your safety pilot problem.

To appliance manufacturers:
Our Engineering Department and the MGSCo. Testing Laboratory are at your service to help you apply the BASO.

MILWAUKEE GAS SPECIALTY COMPANY
MILWAUKEE, WISCONSIN
Pacific Coast Representative
H. V. PAYNE, 3834 3rd Avenue
Los Angeles, California

What Sells Gas Refrigerators?

Electrolux Floor Salesman of Peoples Gas Light & Coke Co. Gives an Idea as to How He Stays at the Top of the Heap Nationally

By CRAIG ESPY, Mid-Western Manager, GAS

HOW do you do it, J. Fred Crohn? You sold 16 Electrolux in one day recently, leading the country in individual sales for the day. You got the national laurels in 1934 with better than 400 boxes to your credit. Three hundred and three was the score for 1935. During the first seven months of this year you've sold 200 Electrolux, you say—and now what I want to know is—HOW DO YOU DO IT?

J. FRED CROHN

"Well I suppose, I try to size up the prospect first, then talk generalities for a couple of minutes to win confidence. With a man its generally hunting, fishing or golf, in keeping with the seasons. The woman is interested in vacations at the moment, or perhaps salads, pies and cakes. I've made it my business to learn something about cooking.

"Then come selling points about the Electrolux. I've made an earnest study of the Electrolux and know what I'm selling. I give them quickly, four selling points. The customer usually asks, at this point, 'Why the Electrolux is better than the electric box.'

"'If there are two boxes,' I ask, 'and one is silent and the other noisy, which would you buy?' 'If there are two boxes and one operates at a lower cost, which would you buy?' 'If there are two boxes, one on which you get free service indefinitely, and the other a limited free-service, which would you buy?' And there again, I've covered the essential selling points.

"The *trouble* with most salesmen is that they don't want to go to any trouble. I follow-up all sales floor leads within 24 hours.

"If my prospect is going on vacation, I get an idea as to where . . . . advise them to take Highway 51 to this point and 31 to that. Perhaps I even visit a travel bureau and telephone the prospect later to stop in at the office, that I have a marked-map showing the proposed trip.

"See this poem about Mother. Look through this sales book and you will find others. If I'm in the home of an elderly person, and the setting is right, I refer to this poem—and tell her where she can get a copy, if one is wanted. You'd be surprised how many women are interested in scrap-books, since Tony Wons has been on the air.

"This order went to a colored family. If you don't know the topic of conversation in the negro section of town, you don't get far. Sure—Joe Louis.

"In the German household, it's the opposite of Louis, plus beer and limburger. In the Italian section it's spaghetti and ravioli. The Swedish people take to lingleberry and ludefish, and the French to wine and champagne.

"The main thing I do is to establish a point of interest, know my product and then sell it."

■ ■

Peoples Gas Light, Changes Departmental Structure

REARRANGEMENT of departmental structure and changes affecting elective officers of the Peoples Gas Light and Coke Co. were brought to a head September 21 by an executive order of George F. Mitchell, president of the company.

Albert L. Tossell was elected to a newly created vice-presidency, in charge of customers' service. James A. Cunningham was elected secretary and assistant treasurer to fill the vacancy caused by Mr. Tossell's elevation. The office held by Frank L. Griffith, who has charge of all accounting activities, has been changed from vice-president in charge of accounts to vice-president and comptroller.

Eskil I. Bjork has been elected to the newly created office of assistant vice-president and assistant comptroller. W. R. Weldon, treasurer, and W. R. C. Galloway, assistant secretary, have taken on the additional duties of assistant secretary and assistant treasurer, respectively.

The office of auditor has been changed from an elective to an appointive office. Charles J. Hill was appointed auditor and will report to Mr. Griffith, vice-president and comptroller. Under the new set up the claims department is under the supervision of the treasurer rather than the secretary; the purchasing department will report direct to the president; the advertising department is under F. X. Mettenet, vice-president in charge of sales. The elective office of assistant to the president has been abolished.

■ ■

Chandler, Ariz. Goes On Natural Gas

NATURAL gas was turned into the distribution system at Chandler, Ariz., on September 4. The event marks the completion of construction on the $18,000 distribution system of the Central Arizona Light and Power Co., Phoenix, Ariz. To transmit the gas from the master main at West Chandler, 7 miles west of the city limits, to the Arizona Company's distribution system, the El Paso Natural Gas Co., El Paso, Tex., constructed a $12,000 line, thus bringing the total cost of the Chandler project to $30,000. Early services have exceeded the engineers' estimates by 83 per cent, with a total in excess of 110.

Harold Mueller, president, L. J. Mueller Furnace Company, Milwaukee, Wisconsin, discusses load building possibilities of Gas Era Furnaces, Boilers, and air conditioning equipment with Mr. A. L. McKinstry, sales manager, Cedar Rapids Gas Co.

CONFUSION MUMBLES IN ITS BEARD

WHILE everyone is stumbling around trying to find a way out of the haze of changing conditions, it's a good time to stick to fundamentals. Our company is still holding fast to the simple business principles laid down by my grandfather long before I reached the age of discretion.

Here is one of those good old homely truths: "Give your customer an honest dollar's worth of merchandise for his dollar". People appreciate THAT today even though there is talk about politicians monkeying with the currency. When my grandad preached that maxim, people were using stoves a lot—the "privileged" class owned furnaces. But there was a common demand for full-value merchandise with a lot of ornate "curlicues".

Tastes have changed, of course. Today there is an almost universal demand for automatic heat—and furnaces of wholesome, modern lines with the value built into the product. Note that people of the new generation also want sound value.

In keeping with the time honored tradition of Mueller principles, our company has pioneered gas heat and air conditioning, as it pioneered earlier methods. Ever alert to the trends in home heating, we saw the popular swing to gas as the final fuel for home heating over ten years ago. Since then Mueller engineers have labored diligently and conscientiously to produce gas-fired equipment which would guarantee to gas companies the heating load which is rightly theirs. And to users, the value of product and economy of operation which they have a right to expect.

MUELLER GAS ERA BOILER

Adaptable to steam, hot water or vapor heating. The Series "A" (54 inches high and 28 inches deep) are ideally suited to small home heating. They are also adaptable to any system of heating or air conditioning employing radiation, convectors, pipe coils, unit heaters or blast heating surfaces. Go after this profitable gas load. Get all the facts about these remarkable Mueller Boilers. Write at once.

Most utility men know the merit of Mueller Gas Era Furnaces and Boilers and Muelleraire Space Heaters. These products will be on display in space 225-226 at Exhibition of Gas Appliances and Equipment, Atlantic City, October 25-30. Be sure to visit us.

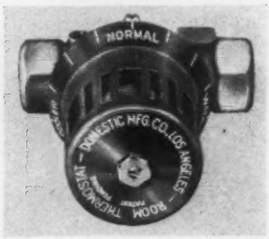
H. L. Mueller

PRESIDENT

MUELLER-MILWAUKEE

YOUR Console Heater SALES Will PROFIT

by the Domestic Room Thermostat



The public is demanding automatic heating. And when a console heater is equipped with a Domestic Room Thermostat to deliver constant automatic heat, it becomes much more saleable merchandise.

The Domestic Room Thermostat is easily installed on the line ahead of the heater. Already many lines of console heaters come factory equipped with the Domestic Room Thermostat. It will pay you to investigate.

Domestic Manufacturing Co.
700 East Florence Ave. Los Angeles, Calif.

BUILD YOUR LOAD WITH

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FLOOR FURNACES

More than 325,000 in use today

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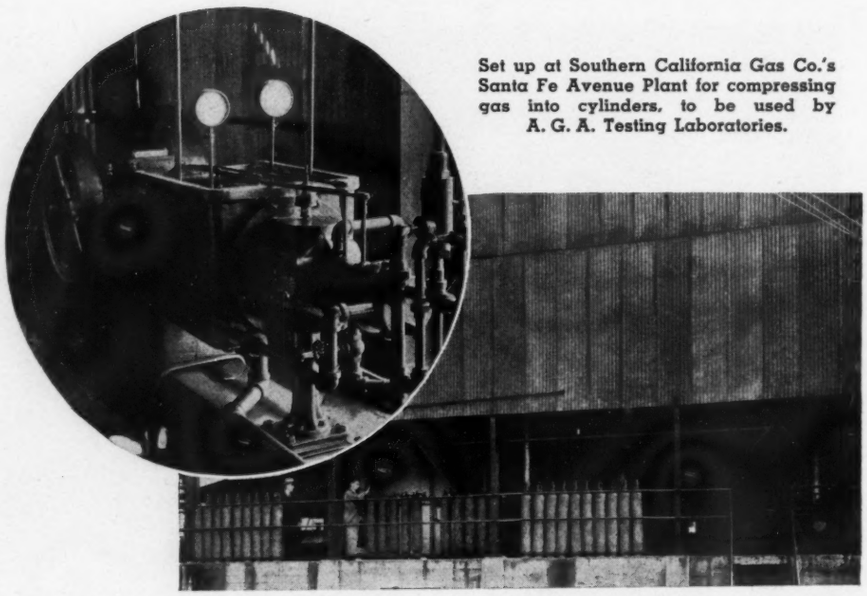


Set up at Southern California Gas Co.'s Santa Fe Avenue Plant for compressing gas into cylinders, to be used by A. G. A. Testing Laboratories.

Oil Gas Compressed for Laboratories

As announced in *GAS* several months ago, Southern California Gas Co. is now supplying the Pacific Coast Branch of the American Gas Association Testing Laboratories with oil gas for use in its testing operations.

The accompanying illustration presents a general view of the Laboratories' set-up at the Santa Fe Ave. plant of the Southern California Gas Co. in Los Angeles for compressing stored manufactured gas into cylinders for subsequent trucking to the Testing Laboratory on Towne Avenue. The gas is stored in a 150,000 cubic foot holder (not shown), and is pumped therefrom and compressed to 1,500 pounds per square inch by the compressor at the right of the general view. The resultant high pressure gas is forced through the overhead line to a manifold feeding the central bank of 10 cylinders. Five are filled at once. Each cylinder draws 90 cubic feet of gas from the holder. Fifty cylinders in all are filled at each trip. In the compression process there is a loss in the heating value of the gas of approximately 29 B.t.u. per cubic foot.

The inset close-up of the compressor unit shows the water cooling provisions and rugged construction required for packing a month's supply of test gas into one truck load of high pressure cylinders.

Portland Gas Co. Reduces Heating, Cooling Rates

PORTLAND GAS & COKE CO., Portland, Ore., has reduced its rates for automatic water heating and refrigeration, according to an announcement by Paul B. McKee, president of the company. Gas cooking customers will have the advantage of a new combination rate, which is supplementary to the company's existing low rates for combined cooking, water heating and house heating service.

The new combination schedule enables the gas automatic water heating customer to use gas for cooking and refrigeration at a small additional monthly cost.

■ ■

Southern Meter Association Holds First Meeting

The first regular meeting of The Gas Meters Association of Florida and Georgia was held at the Colonial Orange Court Hotel in Orlando, Florida, on the 14th and 15th of September. The association was formed last April by a group of Florida and Georgia gas company officials for the purpose of discussing the problems that confront both the operators and commercial men of the two states.

The following officers were elected: V. W. Kennedy, president, Florida Public Service Co., Orlando, Florida; J. W. Owen, vice-president, Central Florida Gas Corp., Winter Haven, Florida; R. O. Berry, secretary-treasurer, Jacksonville Gas Co., Jacksonville, Florida.

Orlando was voted the permanent meeting place. The group will convene twice annually.

■ ■

Metal Society Publishes Books

The American Society for Metals, Cleveland, Ohio, announces the publication of two books of interest to engineers and metallurgists. The volumes are the "Steel Physical Properties Atlas" by C. N. Dawe, Vanadium Corp. of America, and "Engineering Alloys" by N. E. Woldman, metallurgist of Eclipse Aviation Corp. and Albert Dornblatt, U. S. Naval Academy.

BUTANE-PROPANE NEWS

New Building to House Texas Natural Gas Students

A new building, 100 feet by 30 feet in dimension and containing a laboratory, class room, office and store room, is being constructed to accommodate students in the new natural gas engineering department at the Texas College of Arts and Industries in Knoxville. Dr. F. V. L. Patten has been placed in charge of the new department, which will offer courses in the following subjects essential to the industry: natural gas geology, production, measurement, transmission, and distribution; oil and gas laws, natural gas economics, and chemistry of fuels.

■ ■

Thomas and Cameron on West Coast Visit

Ross W. Thomas, general manager, and A. B. Cameron, salesmanager of the Philgas Department, Phillips Petroleum Co., spent several days in California during the last of September and early October, contacting companies engaged in liquefied petroleum gas activities. They came by way of San Francisco and left Los Angeles to return to Detroit headquarters of Philgas on October 2.

■ ■

Ensign Appoints Distributor

The Ensign Carburetor Co., Huntington Park, Calif., announces the appointment of Koepsel & Love of Salt Lake City as distributors for Ensign equipment. Koepsel & Love will stock the full line of Ensign gasoline, butane and natural gas carburetors and parts and will be equipped to render complete service to users. R. R. Wyker of the Ensign Co. will spend several weeks in Salt Lake City assisting Koepsel & Love.

■ ■

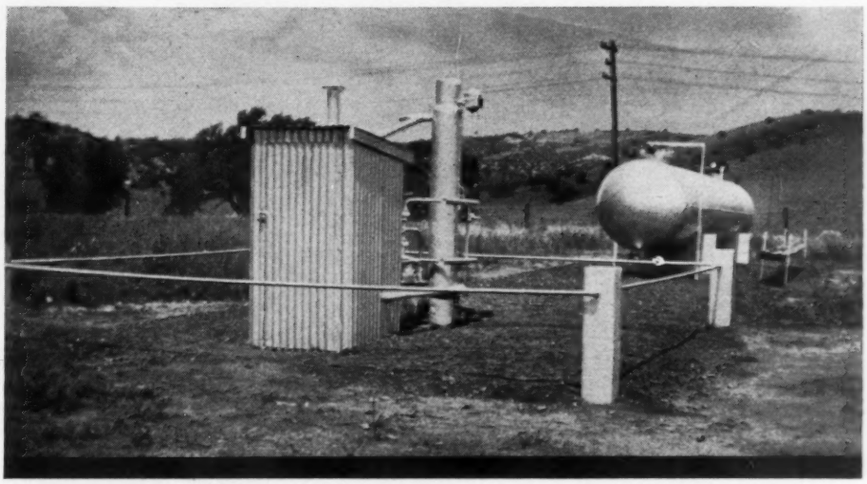
J. H. Luening Dies

John H. Luening, long associated with the compressed gas industry and widely known among its members, died August 20. From 1924 to 1927 he served as secretary and treasurer of the Compressed Gas Manufacturers' Association, a position which he left to become chief engineer of the Kentucky Oxygen and Hydrogen Co., and later of the Helium Co. Recently he had established his own business as consulting engineer, at Louisville, Ky.

■ ■

Stops Marine Sales

Sale of propane for marine usage was recently discontinued by the Pyrofax Division of Carbide and Carbon Chemicals Corp. The former marine customers of Pyrofax were assumed by E. J. Willis Co., 91 Chambers St., New York City.



Over-all view of butane plant and storage facilities at Fort Whipple, Arizona.

Undiluted Butane Installation at Fort Whipple, Arizona

By JOHN K. KOENEMAN

Southwest Gas Corporation, Ltd., Barstow, California

IN July 1936, Western Gas Distributors, Inc., received a contract to serve gas to the Veterans Administration Hospital situated at Fort Whipple, Arizona, near Prescott. The contract specified delivery of gas through a distribution system and installation of a central plant and the necessary butane storage facilities.

JOHN K. KOENEMAN

A plant designed and built by Parkhill-Wade, Inc. of Los Angeles, was installed within the Government Reservation. The butane storage tank is an electrically-welded 4000-gallon capacity storage tank. The vaporizing equipment is motivated by a gas fired automatic water heater and consists of a two stage pressure reduction set-up. The vaporizer operates on liquid gas and has a vapor standby working at a lower pressure.

At Fort Whipple it was decided to serve at 10-pound main pressure and cut to 10 inches of water column with individual house type regulators. To do this it was necessary to remove the two low stage regulators from the vaporizer and to set the high stage regulators at 10 and 8 pounds respectively.

The tank, vaporizer, and water heater were installed on concrete foundations, with a sheet metal building housing the water heater, and the building and vaporizer were enclosed with a fence made of two-inch pipe.

The distribution system is composed of 5800-feet of 1-inch Hill Hubbell wrapped pipe, serving 22 residences and three dormitories. The system stood a 30-pound twenty-four hour test before acceptance by the Government officials. The butane storage tank was tested hydrostatically to the satisfaction of the authorities and the pressure relief valve was tested under actual conditions.

The winter temperature at Fort Whipple becomes quite severe so the entire distribution system was laid to grade with only three traps. The largest area of drain with 3000 feet of pipe terminates at the base of the vaporizer for which a 20-gallon welded drip was installed with an accessible blow-down connection. At the two other low points, three-gallon drips were installed. The gas served is extremely dry, but because of the 10-pound serving pressure, the added precaution of drip installations was taken.

Western Gas Distributors, Inc., maintains bulk distribution from its own source of supply throughout Northern Arizona and New Mexico, transporting to its various destinations by a specially constructed 3000-gallon tank truck.

The capacity of the plant is sufficient to serve a community of 2,000 persons and is capable of supplying any additional load required at this point.

The system has been in service since August 11, 1936 and is giving excellent service.

NOW DEPENDABLE AUTOMOTIVE CONVERSION

WITH THE
BARTON BROWN HEAT EXCHANGER AND REGULATOR

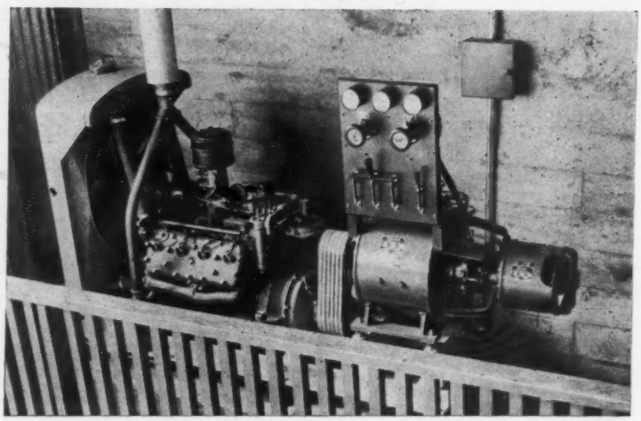
Operating on BUTANE or PROPANE, it converts high pressure liquid gas into a dry gas at atmospheric pressure with 100% shut-off.

- Only one moving element with large bearing area.
- Rugged in construction.
- One simple adjustment only.
- SINGLE STAGE REGULATION — ONE DIAPHRAGM.
- Has unique, duplex heating arrangement whereby the fuel is preheated, then expanded into a large chamber, being finally heated and converted into a dry gas before delivery at atmospheric pressure to the mixing device.

Will start engine quickly on liquid fuel under any weather conditions, without using a vapor line.

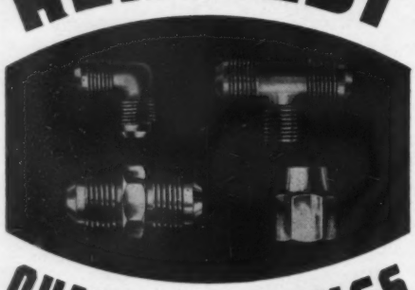
BARTON BROWN ENGINEERING CORPORATION
1109 Santa Fe Ave. Los Angeles

Novel lighting effects and attractive appliance displays add color to Southern Oregon Gas Corp.'s new office.



This gas-actuated Ford V-8 motor furnishes the power necessary to illuminate and air condition the new building.

KEROTEST



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for every propane gas installation

Kerotest Fittings of heavy design are the work of master craftsmen and comprise a complete line of S.A.E. flare crosses, tees, elbows, unions, and nuts for your copper tube installations of propane gas.

Each one is individually inspected to insure smooth, finished seats and clean-cut threads — then individually protected by cardboard ferrules and carefully packed in strong, iron bound boxes,—your assurance of receiving them in factory-perfect condition.

KEROTEST MANUFACTURING COMPANY
PITTSBURGH, PA.

Southern Oregon Gas In New Building

As the latest step in its consistent expansion program into southern Oregon, the Southern Oregon Gas Corp. opened its new $25,000 office, sales, and display building in Medford on September 12. Supplementing the expansion, work on the extension of two important mains in the Medford area was begun late last month, according to an announcement by J. A. Ward, president of the corporation.

The new building, modern in every detail, is completely gas-equipped, incorporating such features as gas air-conditioning and gas lighting for both the exterior of the building and the interior of the shop. Three gasarc lamps of 3600 candlepower illuminate the building facade. An electrical generating plant consisting of a Ford V-8 motor using gas from the corporation's mains furnished all the power used in operating the air conditioning system, the motors in the shops, and even the display neon signs on the front of the building. A model kitchen installed in the display room will be used for demonstrations and cooking schools.

Within the past two years, since reconstructing its plants to distribute butane gas, the corporation has made five substantial rate reductions. Latest reduction was a lowered heating rate for both commercial and residential consumption, effective September 1. During the current year gas consumption has increased over 1935 by 40 per cent.

The corporation serves Roseburg, Grants Pass, Medford, and Ashland as well as the outlying districts in this territory. The service is butane air gas 800 B.t.u., with oil gas plants for standby service.

Gas Service Co. Extends Distribution System

A distribution system expansion program involving the expenditure of over $100,000 is a current project of the Gas Service Co., Kansas City, Mo., according to C. M. Carter, superintendent of construction for the utility. The work will carry service to five major outlying sections of the city and suburban tracts, and that two large industrial plants that have not heretofore been customers of the gas company will go on the service. The construction, which involves the laying of 9 miles of mains, will be completed about Christmas.

Bottle Gas Association To Meet In Atlantic City

The fall meeting of the National Bottled Gas Association will be held on Wednesday, October 28, at Atlantic City. Arrangements have also been made for a tie-in with some of the meetings of the American Gas Association convention, to be held there during the same week.

L.A.G. and E. Appoints Seeley District Manager

M. A. SEELEY, office engineer for the Los Angeles Gas and Electric Corp., has been appointed district manager at Huntington Park, replacing J. C. Guillinger, who is retiring after 33 years service with the company because of failing health, according to an announcement by H. L. Masser, vice-president and assistant general manager of the corporation.

Mr. Seeley came to Los Angeles from Ohio in 1920, joining the Los Angeles Gas and Electric Corp. in 1923. He had served in the gas distribution department and the valuation department prior to his appointment as office engineer.

■ ■

New Cutler-Hammer Plant at San Francisco

Cutler-Hammer, Inc., Milwaukee, Wis., announces the extension of its manufacturing facilities to the West Coast. A new plant, at 970 Folsom Street, San Francisco, Calif., began operation in September. Other factories are located in New York City and Milwaukee.

Special control constructions, dead front switchboards, fuse cabinets and panelettes, panel boards, transformer cabinets and wiring troughs are being manufactured under the direction of O. R. Cooke. F. H. Oberschmidt is manager of Cutler-Hammer's Pacific Coast District.

■ ■

Australian Gas Man Visits Pacific Coast Companies

A. E. Hutchinson, comptroller of gas sales of Australian Gas Light Co., Sydney, Australia, spent the month of September visiting gas companies on the Pacific Coast from Los Angeles to Vancouver. Mr. Hutchinson, accompanied by Mrs. Hutchinson, is on the last lap of an 8-months round-the-world tour, studying sales methods in gas companies throughout the world. He leaves for Australia from Vancouver this month.

■ ■

Inland Announces Expansion

Inland Manufacturing Co. of Chicago announces the appointment of Peter Cheli as its Detroit representative with headquarters at 5427 Grand River. Harry V. Payne was recently appointed Los Angeles distributor for the company. Inland manufactures a line of gas specialties including a safety gas cock, automatic gas cock switch, adjustable external lighter, hanger and canopy for unit heaters, furnace door closer and unit heater hoisting clamps.

■ ■

Printing Demonstration

Propane will be used on a special printing press now being installed in a railway car for an extensive tour of the country. The press is a new-style product of the American Typefounders Co., Elizabeth, N.J., and the purpose of the tour is to display the model to the printing industry. On this sample unit propane will fire the burner which dries the ink and neutralizes static electricity.

UNVARYING STANDARDS

From the selection of proper raw materials . . the design . . and the fabrication . . every Hackney cylinder is an assurance of efficient, economical service.

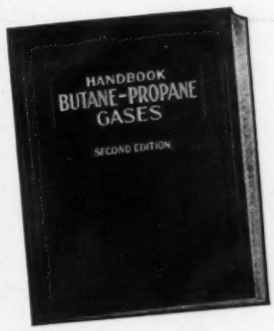
Weight is kept to the minimum without sacrificing the all-important factor of strength. Wall thickness is uniform. Special Hackney welding insures both good appearance and uniform strength. These and other advantages have gained leadership for Hackney cylinders in the liquefied petroleum gas field.

Hackney MILWAUKEE

PRESSED STEEL TANK COMPANY

Rm. 1185—208 S. La Salle St. Bldg., Chicago, Ill.; 6633 Greenfield Ave., Milwaukee, Wis.; 666 Roosevelt Bldg., Los Angeles; 1363 Vanderbilt Concourse Bldg., New York

Containers for Gases, Liquids and Solids



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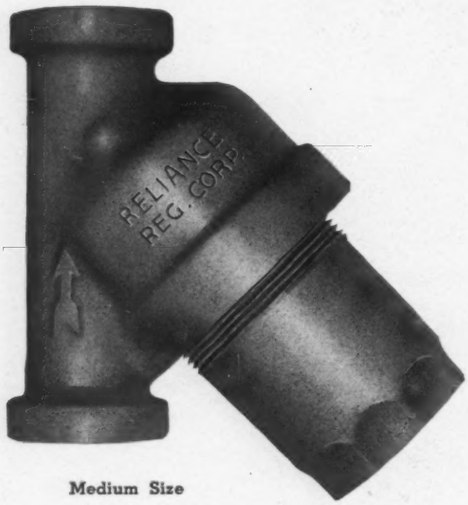


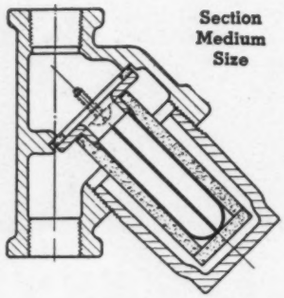
Medium Size

DUSTY GAS?

RELIANCE TYPE "A" FILTERS

Protect Service Lines, Meters, Regulators, Pilot Lights and other Appliances

One standard body with ¾" line connections is tapped with 2" pipe threads for the filter element. Either the small, medium or large size filter element can be used according to local conditions, and filter elements may be removed, replaced or changed in size without taking the filter body from the line. Connections are standard with female threads at both ends, or gasketed unions at either or both ends.



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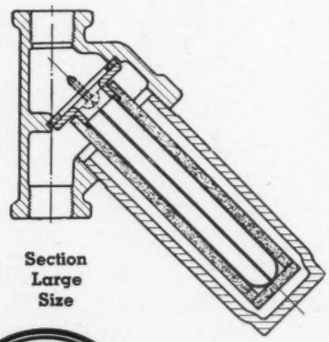

Section Large Size

Low Cost—Easy Installation

These simple, rugged, low-priced Filters will give continuous, efficient, care-free protection to all service lines and connected appliances in dust areas, with the elimination of hazards, repairs and maintenance expenses. They are made to withstand a working pressure of 150 pounds. Three sizes of filter elements provide a full range of capacity. Installations may be made vertically or horizontally with the dust chamber hanging downward.

Filter pads are made of special all-wool felt, and all seams are securely cemented with a water-and-oil-proof compound, building up a complete dust-proof barrier between the inlet and outlet connections of the Filter. Moisture in the gas will not impair the effectiveness of the wool felt. Thousands of Type "A" Filters are doing good work all over the country. Complete description in Bulletin No. 35. Secure your copy.

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1000 Meridian Avenue **Alhambra, California**

RELIANCE REGULATORS

MEASUREMENT and CONTROL

The Measurement of Gas Under Vacuum

By J. B. TAYLOR, Jr.
Gas Engineer, Signal Oil & Gas Company*

GAS is usually measured under pressure, and it is only in the oil fields where the gas has valuable gasoline content that it is desirable and economical to handle the gas under reduced pressures or vacuum.

Gas that is produced with oil carries some gasoline content varying from one-half gallon per 1000 cubic feet of gas to, in some cases, more than 12 gallons to 1000 cubic feet of gas. The richness or amount of gasoline contained in the gas is dependent upon a number of factors, but among those factors, is the pressure at the point that the gas is liberated from the oil. During the time of flush production in a field, the volume of gas produced is large and the pressure on the formation is usually high. This tends to produce a gas less rich in gasoline content and with the large volume produced, makes it necessary to handle the gas under pressures above atmospheric. Volumes many times exceed pipe line capacities, and gas has to be blown to the air. As the production of the field declines, the pressures on the gas lines are reduced, that is in the lines taking gas from the wells. In time, as the formation pressure drops, the gasoline content of the gas increases, and the lower the pressure drops, the richer the gas becomes; and depending upon other production factors, such as the total volume of gas to be handled and the actual content, it becomes of value to continue reducing the pressure if the compressors and equipment are avaliable, until pressures less than atmospheric are maintained. Most of the older fields where the gas production has reached low levels, are operating with vacuum on the "wet" gas lines from the wells. This vacuum is extended even beyond the field lines to the casings of the wells, where a vacuum is pulled on the formations. In some districts, where formation pressures are low, the added vacuum, may even be an aid to the oil production. These vacuums vary from atmospheric pressure down to 21 and 22 inches of mercury and this is at times exceeded where the gas volume is extremely low. Fifteen to 20 inches of mercury vacuum is common in the Los Angeles basin.

The gas may be taken from the wells at the casing, or to the trap where the gas is separated from the oil, or at both places. Gas taken from the casing is usually taken at full line vacuum. This gas is free from fluids, and condensate may drop out in the lines from this gas due to pressure and temperature changes, but at the well casing fluids do not ordinarily exist. The tubing gas, or gas taken from the oil separating trap, may at times carry fluid, either water, oil or emulsion, in varying quantities, from a mist to a solid stream of liquid should the trap become inoperative for some reason. With vacuum on the gathering lines, connections to oil traps must be carefully watched as the vacuum can lift the fluid from the trap according to the amount of vacuum on the line. Many times connections to field traps must be changed to protect the line from fluid because of the increasing vacuum.

One inch of mercury vacuum will lift a column of water about 1 foot and according to the specific gravity of the oil will raise the oil in proportion. Oil as produced often contains enough gas in solution to be gassy and cause a foaming fluid that will lighten the column of fluid so that it is often well to figure as much as 2 feet of head to an inch of mercury.

Oil traps that are set upon the ground level must have some means of breaking the lift of the vacuum to prevent oil from entering the gas lines. Usually a regulator is placed on the vacuum line and set so as to hold enough pressure on the trap to insure forcing the oil to the storage tanks. This is important because at the present time, production methods are placing dehydrators on the flow stream between the traps and the storage tanks, and it is quite essential that the pressure kept on the trap is sufficient to prevent accumulation of vapor in the dehydrator causing a "vapor lock" in the oil flow, thus sending the oil production into the gas line. The usual operating procedure when vacuum is desired on the casing is to connect the casing line downstream of the regulator.

The most common installation on small wells is to elevate the trap in the derrick at a sufficient height above the storage tanks that the oil level will have enough liquid head to break the vacuum. The gas line may then be given such added height above the trap that the vacuum lift will not extend above the total height of the fluid. Installation of a regulator is not necessary in this case.

Often oil flow lines to storage tanks are run to the bottom of the tanks. If at any time the trap should stick open the vacuum may not only draw production but may also siphon the oil from the tanks.

The above description has been included because as can be readily understood, the conditions under which a well operates adds to metering problems when gas is measured below atmospheric pressure.

As mentioned before, when larger vacuums are held on the gas lines, it is because the production has declined to a low level and, in general, wells of over 100 mcf .volume are the exception, and the average is apt to be somewhere between 20 mcf. and 60 mcf. per well per day. Where the gas is rich, wells producing less than 10 mcf. daily are metered. Due to the gasoline content, the water vapor, and condensates, it is not possible to accurately measure this "wet" gas with displacement meters, the orifice meter has been the only practical instrument for this type of work.

As with all gas metering, no two metering conditions are alike in the field. Some wells will produce gas regularly, others irregularly, and some will produce in quite regular periods.

There is no distinction between the meter set-up for measuring gas at less than atmospheric pressure and the measurement of gas under pressure. However, individual cases may produce conditions where, the particular meter may have to be set with drip pots on the leads, or mercury pots, due to the flow conditions at the particular location. The gas at that place may carry an excessive condensate for some reason, or the flow may be so erratic as to blow the mercury. Check valves are of assistance, and are really necessary in all meters, but with water vapor present, and at times some air due to leaks in lines, rust and corrosion often prevent their working.

The best means of reducing the trouble caused by the presence of fluid in the meter run is to set the meter run above the level of the main gathering line, so that once the fluid has passed the orifice, it will flow on into the main line and not accumulate in the meter run. Where flow volumes are small and fluid is present, the ever-changing pressure in the system may cause the liquid to flow back and forth in the meter run, causing the meter to record a pulsating flow, when it is entirely possible that no gas flow exists. Any metering indicating a back flow should be thoroughly checked for this reason. A check valve installed downstream of the meter run in the line helps to solve this trouble. A small positive flow of several thousand feet daily may actually pulsate in the line where line pressures are quite variable. The meter under such condition may even show a backflow where the increasing line pressure changes faster than the well is producing gas of its own. This is true particularly where the gas line is connected directly to a casing which acts as a reservoir. Under these conditions, the meter will record a positive flow on the highest vacuums on the line and a back flow at times when the line pressure raises and allows gas to flow back into the well casing. Check valves in the gas lines have often proved valuable under similar conditions in reducing meter pulsations preventing backflow and in making an impossible chart quite readable.

There are many instances where it is not

* Presented before the Southern California Meter Association, August 28, 1936.

possible to set a meter run above the main gathering line, due to possibly a number of meter runs having to be set in a low area. Under these conditions, it is necessary to install a large drip tank below the line or at the lowest point to collect the fluid. Drip tanks are numerous on vacuum lines, particularly on the main trunk gathering lines. They are installed so that they may be shut off from the vacuum and pressure introduced to blow the fluid into a truck for disposal. Under line conditions, when the velocity is high enough as to carry the fluid with it, such tanks are unnecessary, but as the mass velocity decreases, the fluid collects in the low points and eventually drip tanks have to be installed wherever the fluid is found to collect. Vacuums are hard to maintain on a large gathering system, as they require considerable compressor capacity due to inefficiencies of high compression ratios; and for this reason, everything is done to maintain pipe lines with the lowest possible pressure drops and to do that particularly requires that fluids be removed.

As mentioned before, these fluids may be water, gasoline, oil or emulsion. The presence of oil and emulsion in the gas lines are directly the result of a trap not operating properly. This condition may be corrected whenever found. The gasoline is usually condensed due to a change of flowing temperature. The well may be producing at a higher temperature than the average atmospheric temperature, consequently some of the gasoline is condensed in the gathering system where the pipe lines are of a lower temperature. The water is condensed in the same manner as the gasoline condensate. In practically all cases, where the decline of the field has set in, some of the wells—probably most of them—produce some water with the oil. The gas will, in these cases, carry the water as a vapor. The amount of water vapor is proportioned to the flowing temperature and existing absolute pressure. The higher the flowing temperature and the lower the line pressure, the more water vapor the gas will carry. Under 18 inches of mercury vacuum and average atmospheric temperature of 75°F, the gas, if saturated with water vapor, will carry approximately seven percent of its volume as water vapor. Where the wells carry water with the oil, the gas is usually near saturation.

Fluids, in addition to causing erroneous flow records in passing through the orifice, will also collect in the meters, producing inaccurate differential readings. Oil and emulsion, which is a heavy mixture of oil and water in suspension will also get into a meter and where flow conditions produce a heading chart, the agitation of mercury will produce an emulsion of mercury with the oil and water. In any of the conditions mentioned the meter must be completely overhauled and cleaned. Places where there is a slight leak in the meter or meter leads, air, or course, leaks in and with the water vapor present, will soon rust the leads and interior working parts of the meter. Cases have been found where the meter leads had accumulated rust until the leads were practically closed.

In routine checking of meters under vacuum, it is well to check each meter lead to insure it is open and will permit an accurate meter reading. This may be done by opening the by-pass valves and the bleed valve to the air noting the amount of air each lead will take in when opened to the line. A little experience and the meter man will know whether the lead is partially plugged or whether it is open. Meters on vacuum are usually calibrated the same as any others under atmospheric pressure. They may be calibrated in the field by taking the meter off the line and using an aspirator bulb to produce the differential necessary to check against a manometer. The static arm should be calibrated against a mercury manometer, rather than the ordinary gauge. The reason for this is apparent when you consider that with 20 inches of mercury vacuum, at sea level, the absolute pressure is approximately 5 pounds. One tenth of a pound difference in this range will produce a one per cent error in the computed volume. It is usually desirable to check the static against the actual operating range or the normal variations, for quite often springs are found that are not accurate over the meter range. The per cent of error is greater however in the lower pressure ranges and for this reason, the static should be set fo the operating range of pressures.

Accuracies of metering under vacuum are dependent upon all the factors. Volumes measured are usually small, but read and reported only to the closest 1000 cubic-feet daily. A difference of 1000 feet in a 10,000 cubic foot flow is 10 per cent, and if the average flow of all the meters is 50,000, a variation of 1,000 feet on the average flow is two per cent. Under such an average flow condition and an assumed two per cent error in accuracy, the flow temperature may vary as much as 20 degrees, or the gravity may vary four figures in the second decimal place, or the ratio of h/P may change by one and one half times, each giving the same degree of accuracy. From this standpoint, the new coefficients have mainly confused the calculations in this type of small volume field metering. The use of the new coefficients is an improvement in the technique of orifice measurement, but to carry the factors to four decimal points is beyond the accuracy of the actual flow conditions. No calculation is ever more accurate than the elements that go into making the product. In this regard, it is not necessary, or rather it is false accuracy to change these factors oftener than the per cent of error evident in the calculations. Orifice meter charts are read to the closest 0.1, either differential of static, that is all the eye can see, and in the case of square root charts, in the section below 3, tenths are questionable. Common practice is to use a slide rule to extract the square root of the product of the static and differential, giving an answer in two decimal points. The expansion and Reynolds factors have been changed by some companies when the differential or static either doubled or was reduced one-half. This permits a reasonable variation in the readings without affecting the accuracy of the results.

The chart records on gas metered under vacuums show a large range of operating conditions. Where tubing gas is taken the flow may vary from a rate as much as one million feet daily to actual zero over a period of a few minutes. This is also true where there are intermittent gaslift operations. Such flows must be checked and enlarged by taking an hour chart to determine the actual time interval. Frequently this type of flow is consistently similar so that one or two hour charts will indicate the usual flow. Under these conditions it is difficult to maintain meter set-ups according to the range of differential and pressure ratios. Such a heading condition under high vacuum may require a large plate size, making it impossible to read any flow between heads less than 50 mcf. daily. Still the total flow of the well may be less than a reading of 0.1 differential over a 24-hour period. It is possible that should the same well stop the heading action, that a small orifice will record the flow, in which case the line size would be out of the range of beta desirable. Again, the accuracy of the measurement of the total flow is probably within the range of the accuracy of the coefficient that is calculated for the set-up, though below the ratio of orifice size to line size desired.

The element that permits of the greatest variation for smallest actual change in figures is the gravity, where a variation of two figures in the second decimal point makes a one per cent change. It is this same gravity determination that is the most difficult to obtain accurately. At present, there is no simple practical, method of obtaining the specific gravity of a gas under actual operating conditions, other than atmospheric. This is a most needed development, since any change in a gas from a low pressure to a higher pressure will change the constituents of that gas, assuming a gas to have some gasoline content. Raising the pressure an inch or two will condense something, some fraction, or even water, that will alter the actual flowing gravity. There is also the contamination of the gas in handling it and raising it to atmospheric with the usual vacuum pump. Since, in general, the higher the vacuum existing, the richer the gas is in gasoline content, the specific rgavity is also higher. Raising this gas to atmospheric pressure to obtain the gravity will alter it materially more than the gas that is at a few inches of vacuum. Just how much the alteration of the gravity may be is not a factor that may be determined and applied for all gases, but is dependent upon the fractions of the individual gas. Field gravities are determined with the ordinary Schillings jar in most cases, and the Acme balance and the Edwards balance are used when gravities are determined in the laboratories.

■ ■

Illinois Utility Announces Personnel Appointments

Recent appointments and promotions in the Public Service Co. of Northern Illinois, headquartering in Chicago, according to an announcement from the executive offices are as follows: C. H. Schildgen as northern division sales manager; George Mitten as manager industrial development; G. K. Hardacre as sales promotion manager; C. R. Bishop as assistant advertising manager; Ray Warren is transferred to the position of chief clerk; and Theodore Blech, former sales manager of the western division, has been transferred to the staff of the general division manager.

Meglin Kiddies Entertain So. Calif. Meter Men

UNIQUE among the regular monthly meetings of the Southern California Meter Association was the one held on the evening of September 24 at the Van Matre Inn, Huntington Park, Calif. Fifty-one members were entertained during dinner with a Meglin Kiddies revue followed by two young ladies who rendered several accordion duets. The entertainment was by courtesy of the Pittsburgh Equitable Meter Co. with E. H. Adams of that company acting as master of ceremonies.

First speaker of the evening was Lionel L. Van Deerlin, editor of the Daily Trojan, University of Southern California campus newspaper, who recounted some of the high lights and his impressions of the XI Olympiad at Berlin. In the absence of the author, R. F. Angel, S.C.M.A. Program Chairman, read a paper on "Combustion" by L. P. Stoker of the Precision Control Co., San Francisco. This was followed by lively discussion from the floor.

M. J. Cereghino of the Los Angeles Gas and Electric Corp. discussed "What Every Meterman Should Know About Mercury," illustrating his talk with slides showing a method for cleaning and purifying mercury without danger to the operator.

■ ■

Plan to Serve Natural Gas To St. Thomas Approved

An offer of the Dominion Natural Gas Co., Buffalo, N. Y., to pay $150,000 over a two-year period for the distributing plant in St. Thomas, Ontario, Canada, has been approved by the city's Public Utilities Commission. The offer is coupled with a grant to the company of a 10-year natural gas franchise. Plans to spend $30,000 in changing the system from manufactured to natural gas have been outlined by the company. The commission has recommended that the proposition be put to vote at an early date.

■ ■

Gas Outgains Electricity on Commonwealth Lines

From the hotbed of T. V. A. electrical competition comes encouraging word that gas is more than holding its own. Wendell L. Willke, president of the Commonwealth & Southern Corp., which has both gas and electric properties in the T. V. A. belt, states that his company's 1935 gas sales exceeded those of 1934 by 14.22 per cent, while electric sales for the same period gained 13.62 per cent. Electric customers of the company increased 4.36 per cent, gas customers 5.49 per cent.

■ ■

Fixmer Made Western United Purchasing Agent

William E. Fixmer was recently appointed Purchasing Agent and Supervisor of Stores for the Western United Gas & Electric Co., Aurora, Ill., according to an announcement by J. F. Egolf, vice-president of the company. Mr. Fixmer, who succeeds S. J. Ricker, deceased, formerly held the positions of Supervisor of Customers Accounts and Traveling Auditor. He entered the company's service in June, 1908.

"Calif. Oil World" and "Petroleum Industry" Merged

CALIFORNIA OIL WORLD, published for the past 30 years in Los Angeles, and credited with being the world's first publication devoted exclusively to the oil industry, came from the press in its October 8 edition under a new name—"California Oil World and Petroleum Industry." "Petroleum industry" was founded recently by Walter C. Monroe and a group of associates, as a monthly publication, but the merged magazine will continue as a weekly. Staffs of both publications will produce the new periodical.

Mr. Monroe, who is president and general manager of "California Oil World and Petroleum Industry," entered the oil publishing field originally as co-founder of "Petroleum World," leaving his connection with that publication several years ago.

■ ■

Severy Grants Franchise

The Stryker Gas Co., Fredonia, Kansas, has been granted a 20-year franchise for serving natural gas in Severy, Kansas.

The system will be supplied from a field 1½ miles north of the town through a 3½-inch pipe line. The distribution system will carry low pressure and will consist of 5-, 4- and 2-inch pipe. The rate charged will be $1 for the first M c.f. and 45c per M c.f. thereafter with a $1 monthly minimum. The system is being designed for serving 250 meters.

CONNELLY
1876 1936
60 Years Service to the Gas Industry

VISIT BOOTH NO. 231 AT AGAEM EXHIBIT

Gas Purifying Materials. For Highest Activity and Capacity.
IRON OXIDE ORE — Commercially Dry—Hydrated and properly Alkalinized—Ready for Mixing—Bulk or Bagged.
IRON SPONGE—Connelly Trade Name—Ready Mixed — Connelly Special Fillers give longer and better service.

CALOROPTIC — BTU Indicator — Can be furnished with Signal and Alarm Unit.
GOVERNORS and REGULATORS. STATION—Balanced and Automatic; DISTRICT—Float or Diaphragm Control; SERVICE—All sizes for any pressure; APPLIANCE—Full line of accurate, compact Regulators.
BACK PRESSURE VALVES — U-GAUGES—H_2S TESTERS.

Connelly
Iron Sponge & Governor Co.
Chicago, Ill. Elizabeth, N.J.

CF
Cut-Out Latch Regulator

If Gas Fails the Regulator will close and lock

THERE are no hazards due to failure of gas supply where the Fulton Cut-Out Latch Regulator is installed. Let pressure drop below the set minimum and the latch automatically shuts and locks the valve. Before flow will resume, the operator must open the valve by hand. Users of low-pressure furnaces and burners protect their equipment effectively, at little cost, by adoption of this safeguard.

Dependable C-F Regulators for all requirements of pressure control are used in widely varied branches of industry. Catalog on request.

THE CHAPLIN-FULTON MFG. COMPANY
28-40 Penn Avenue Pittsburgh, Pa.

COMMITTEE
A. C. Joy, (P. G. & E.)
Chairman
J. S. Spaulding
(L. A. G. & E.)
Forrest Raymond
(San Diego Cons. G. & E. Co.)

Load Building News
P. C. Gas G. A.
THE MODERN FUEL

COMMITTEE
Douglas Buckler
(So. Calif. Gas Co.)
Clifford Johnstone
Managing Director
(P. C. G. A.)

Eighth consecutive year of regional cooperative advertising, Pacific Coast Gas Association

P. C. G. A. CAMPAIGN RECEIVES NATIONAL RECOGNITION

"Business Week" Publicizes Cooperative Advertising and Pays Tribute to Gas Industry of Coast.

"Business Week", national magazine for business executives in the September 5 issue (pages 40-41) and September 12 issue (page 39), describes in glowing terms the cooperative advertising effort of the P. C. G. A. They state, in part, " . . . the cooperative advertising campaign sponsored by the members of P. C. G. A. and now entering its ninth consecutive year . . . is considered in the gas industry as an outstanding promotion job . . . so successful has it been, in fact, that other gas marketing groups are studying its methods, are turning to the same thorough promotion."

Convention Exhibit Attracts Attention

1936 cooperative advertisements and news stories displayed in the convention lobby received much favorable comment. Center of the striking display was a huge upright book over 6 feet high, containing reproductions of domestic consumer advertisements. This was flanked on both sides by double panels each 6 feet tall on which were mounted. trade journal advertisements and published articles placed by the P. C. G. A. News Service.

Architects' Magazine Publishes Feature Article

California Arts & Architecture devoted three pages in the September issue to gas heating, one of the most complete articles yet published on this subject (pages 28-29-30). The material for this illustrated story, covering all types of house heating, was supplied by the P. C. G. A. News Service.

THE FIRST STEP
Towards Controlled Winter Comfort
FOR THE children's sake (and yours too) resolve to have clean, uniform, healthful gas heating *this winter*
End dangerous, cold-breeding fluctuations in temperature. Say goodbye forever to smoke, soot, noise and the bother of fuel-delivery and storage. Laugh at winter's winds, drizzly dampness and penetrating chill.
At a cost comparing favorably with antiquated heating methods, revel in the luxury of constant indoor June.
Like automobiles, gas heating appliances have made tremendous forward strides. Inexpensive automatic control is now available for all types. *Adequate*, up-to-date gas heating is within reach of every home. Now is the time to modernize.
Moderate prices, the easiest of terms, low gas rates—all combine to make *Controlled Winter Comfort* both a boon and a bargain. For quick action, request advice and estimates from your Gas Company or Appliance Dealer. Or take the first step by mailing coupon now.
1. FORCED AIR UNIT. New fan type. Fits any nook or closet, downstairs or up. (*)
2. CENTRAL COMBINATION HEATING-VENTILATING PLANT. Circulates filtered air with controlled humidity—warm air in winter, cool in summer.
3. RADIANT HEATER for a clean, cheery fireplace. (*)
4. STEAM BOILER for gas-fired central heating plants.
5. COMBINATION WATER-HEATING AND (HOT WATER) HOUSE-HEATING UNIT. Dual functions; one compact appliance. (*)
6. FLOOR OR WALL FURNACE. Economical; space saver. Single or in unit separately controlled. Heats one room, several or all. (*)
7. GAS RADIATOR (Steam or direct-heat). Individual control for each room. (*)
8. CIRCULATING HEATER. Quick, low-cost heat for one to four rooms. (*)
9. WARM AIR FURNACE. One of the most popular types
(*) No basement needed for these gas appliances.
MAIL THE COUPON (or a post card) for information on care-free heating with
Gas
THE MODERN FUEL
PACIFIC COAST GAS ASSOCIATION,
*447 Sutter Street, San Francisco.
I would like more information on heating appliances designated by the following numbers in your ad:
My Name
Address
*A non-profit service organization, of which your Gas Company is a member.

Miniature reproduction of full-page Domestic Consumer advertisement—October.

K. G. Merrill Returns From European Trip

K. G. Merrill, president of M. B. Skinner Co., South Bend, Ind., has recently returned from a business trip to Europe. He visited various petroleum and gas headquarters in Paris, The Hague and London in the five-week period spent abroad. Mrs. K. G. Merrill accompanied Mr. Merrill on the trip. The M. B. Skinner Co. is the manufacturer of a full line of pipe clamps for oil and gas lines.

■ ■

Kansas Pipe Line Appoints Redmond General Manager

The Kansas Pipe Line and Gas Co. announces the appointment of S. B. Redmond of Salina, Kansas, as general manager of its properties, effective September 1, according to L. E. Fischer, president.

Mr. Redmond has been associated for many years in an executive capacity with the natural gas division of the Kansas Power and Light Co. His new headquarters will be at Elm Creek, Neb.

■ ■

Natural Gas Well Report

A comparative study of the output and the intake of characteristics of six natural gas wells in the Texas Panhandle field, supplemented by surveys of shut-in pressures of closed-in wells near three of the wells from which pressure and flow data were obtained, is offered in a recent Bureau of Mines report by M. A. Schellhardt and E. L. Rawlins, designated as R. I. No. 3303.

Calendar

October

American Gas Association — 18th Annual Convention, Atlantic City, N.J., week of October 26.

National Metal Exposition of the American Society for Metals—Cleveland, Ohio, October, 19-25.

Exhibition of Gas Appliances and Equipment—First Annual Convention, Association of Gas Appliance and Equipment Manufacturers (In affiliation with the A. G. A. Annual Convention), Atlantic City, N.J., October 25-30.

November

American Petroleum Institute—Annual Convention, Chicago, Ill., November 9-12.

Sixteenth Gas School and Conference—Iowa State College, Ames, Iowa, November 18-21 inclusive.

Mid-Continent Oil & Gas Association—Annual membership Meeting (Kansas-Oklahoma Division), Tulsa, Okla., November 20.

Twelfth National Exposition of Power and Mechanical Engineernig — Grand Central Palace, New York, November 30 to December 5.

June

Canadian Gas Association — 30th Annual Convention, Ottawa, Canada, June 10-11.

Characters in P. G. and E.'s "Good Old Daze" skit pose for the camera.

P. G. and E. Sales Skit is Humorous Method of Employee Education

DURING the 1936 Industry Spring Gas Automatic Water Heater Campaign in Northern and Central California, the North Bay Division of the Pacific Gas and Electric Co. brought about a high degree of successful cooperation among its 500 non-Sales department employees through the medium of a sales presentation entitled "In the Good Old Daze" or "Grime Does Not Pay." The skit was prepared under the direction of A. L. Walker, Division Sales Manager.

Inasmuch as the territory within this division extended over six counties, the presentation was arranged as a traveling road show, which presented the play on an improvised stage in the company warehouses at five central points within the division.

The prologue to the play called attention to the fact that many people who continuously lived in the past and talked about the "Good Old Days" should be spelling the word "days" with a "Z" indicative of the unsettled state of mind, and opened with a musical overture reminiscent of the early days when the tank water heater was the latest modern equipment.

The scene was laid in Mr. and Mrs. Pat O'Grady's kitchen on a hot summer day with Mrs. O'Grady bemoaning the labors of washing and boiling her clothes over a hot kitchen fire and praying to the saints for some deliverance for a contraption which would lessen her labors. They are visited by an enterprising German middle-aged neighbor, Mr. Herman Schultz, a retired brew master and leader of the band, together with his plump and rosy cheeked wife, Lena.

While Pat marvels at the plumpness and freshness of Lena, Herman explains she doesn't stand over a hot stove and boiling water but has the very latest thing, a tank water heater. Before leaving they have convinced Mr. and Mrs. O'Grady they should send the plumber around. Another scene ensues depicting the plumber and the salesmanship of that time, signing Mr. and Mrs. O'Grady on the dotted line for a tank water heater.

Fifteen years elapse and the four are still good friends, but while Lena has continued to remain young, the annoyance of the tank water heater has been a source of worry to the O'Grady's. Herman again re-enacts the scene of 15 years ago and tells about an "automatic water heater" and the wonderful things it will accomplish. Pat is surprised to find that a slight matter of fifteen years should have rendered his tank water heater obsolete, but agrees again to see a salesman.

In the concluding scene between the salesman and Mrs. O'Grady, all of the benefits of an automatic water heater are stressed, together with the generous trade-in allowance, installation and long term payments. Following an exact digest of the campaign offer, every obstacle which Pat offers, and which had been devised to cover the wide range of difficulties encountered in the sale of an automatic water heater, are satisfactorily and completely answered. Mr. and Mrs. O'Grady buy the water heater and upon its installation invite the Schultz's in and everybody is happy.

While the skit was replete with humor, it followed definitely the lines of the campaign and afforded a means of putting in the mouths of non-Sales Department employees, the necessary replies to customers who offered reasons for not buying. It also gave them in a manner which was remembered, the price of water heaters, trade-in allowances, installation, terms, etc.

An exact replica of a tank water heater and an automatic heater together with pipes and fittings were made from fibre-board painted in a realistic manner and installed by being

stapled during the show to the walls at a proper location in the kitchen.

The orchestra was composed of members of the cast who set each scene for time by using an appropriate piece of music of the days in which the scene took place.

In the period of one month this division sold more automatic gas water heaters by 35 per cent than had been sold in the entire year of 1935 or 1934. The highest domestic appliance salesman sold, in addition to his regular appliance sales, 46 water heaters while the entire group of salesmen averaged 20 heaters per man.

Employee cooperation increased 200 per cent and the salesmen found upon calling upon the prospects turned in by employees that the prospects had received more accurate and complete information on the campaign than any other previously held in the division.

In order that the domestic appliance salesmen would not be taken from their regular duties by taking part in the skit, the talent was drafted from among supervisors and commercial and industrial salesmen.

■ ■

MacKnight Returns to Post

George P. MacKnight has returned to the Porcelain Enamel Institute, 612 N. Michigan Avenue, Chicago, Ill., as secretary, to succeed Kurt R. Groener, who has resigned. Mr. MacKnight, who was associated with the Institute from 1931-1934, has been engaged in other association activities and publicity work for the last two years.

▲

Exhibiting Laclede Gas Light Co.'s float is D. J. Fagin, sales engineer in charge of new building installations.

▼

Gas Float Promotes Dealer Interest

BY participating in the parade which officially opened Warm Air Heating and Air Conditioning Week in St. Louis, Missouri, the Laclede Gas Light Co. not only told several thousand spectators that gas heat is the ideal heat for air conditioning but also further increased goodwill between the gas company and local heating engineers and contractors.

The display was built on one of the company's large trucks and was painted a bright yellow. In the center a blue and orange cut-out represented a huge gas flame. On either side of the background was a gas-designed warm air furnace, and copy, in red and black, told the following message: "Best for winter air conditioning—*Gas Heat.* This unit gives you the convenience of gas heat and the comfort of winter air conditioning. See your heating contractor for complete information."

■ ■

Bristol Sales Executive Visits Western Industries

H. E. BEANE, field sales manager for The Bristol Co., Waterbury, Conn., is now on the Pacific Coast, contacting important industrial plants in the states of Oregon, Washington and California. A sales engineer of the company since 1920, during which time he served for six years as district manager of the company's Pittsburgh office. Mr. Beane has had a rich background of instrument application experience, particularly in the lumber, public utility, steel and canning industries.

H. E. BEANE

The Bristol Co. expects to establish a new sales and service office in the northwest in addition to the company's present West Coast service laboratory and assembly plant located in San Francisco. The Bristol Co. is the manufacturer of a complete line of recording instruments.

■ ■

F. L. Whipple, Standard Oil Executive, Passes

Frank L. Whipple, 53, district purchasing agent for the Standard Oil Co. of Calif., passed away October 1 from a heart ailment. Mr. Whipple had been with Standard Oil since 1919.

Devoting practically all of his life to purchasing activities, Mr. Whipple was at one time connected with the Stone and Webster Engineering Corp., later joining the purchasing department of the Northwest Electric Co. A graduate of the Colorado School of Mines, he was identified with the early days of the mining industry in Arizona.

GOODMAN
USED SINCE 1897
2" HANDLE & LOCKING SLEEVE
GAS MAIN STOPPER

The Goodman Stopper

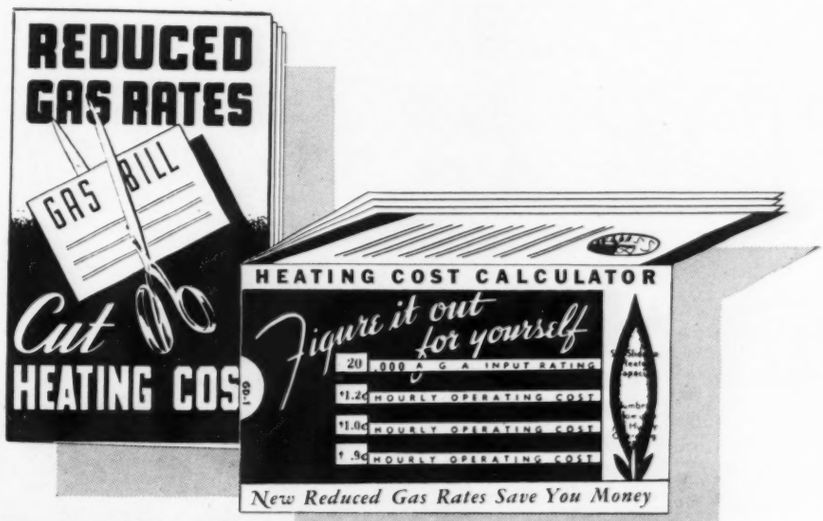
The Reliable Shut-off for Street Mains

Equipped with Improved Patented Locking Sleeve, which locks both handles to the pipe. Stopper cannot slip. Gas cannot pass.

Safety Gas Main Stopper Co.
523 Atlantic Avenue, Brooklyn, N. Y.

Pac. Coast Rep.: C. B. Babcock Co.
135 Bluxome Street
San Francisco, California

The Big Name in
HEATING
and AIR
CONDITIONING
is
MUELLER-MILWAUKEE



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In P.G.&E TERRITORY gas heat is *"KNOWN COST HEAT"*

To the gas heating trade it may be interesting to know that P. G. and E. advertising this Fall will feature the Heating Cost Calculator (described in the September issue of "Gas"). By stressing the fact that gas heating costs can be predicted accurately and proving that these costs, particularly under our New Reduced Rates, are low, we hope to remove any lingering doubts as to the economy of gas fuel. At the same time, we intend to prove that gas operation is really so convenient, so clean, so quiet, so work-free that the gas user is money ahead. Dealer tie-in advertising should, of course, carry along this theme. Gas heating is economical!

P·G·and E·

PACIFIC GAS AND ELECTRIC COMPANY

Owned · Operated · Managed by Californians

WG 210-1036

WANTED—Briquette machine suitable to briquette coal, coke, flue dust. Advise condition, location, and approximate price f.o.b. car. Box No. 43, c/o G A S, 810 So. Spring St., Los Angeles.

WANTED:—Engineering graduate 25 to 35 years old with plant experience in Natural Gas Industry to train for work of Sales Engineer for well known manufacturer of recording instruments and automatic control equipment. Must have outstanding personality and highest character references and be free for extensive travel and quick transfers. Candidates preferred who also have successful experience in sales solicitation. Write, describing education and experience and stating age and salary desired. Address Box 42, care GAS, 810 S. Spring St., Los Angeles, Calif.

Find Many Uses for Gas at Texas Centennial

TO serve the Texas Centennial, now in full swing in Dallas, Texas, the Dallas Gas Co. has installed a complete gas distribution plant large enough to furnish gas to a fair-sized city, more than 12,000 feet of main and several thousand feet of service line having been put down to insure gas service at every point within the Centennial grounds.

Work on the Centennial gas system began at the first of the year with the removal of all gas mains on land condemned for the Centennial grounds. In April, working on a rush schedule, gas men started construction of the new welded steel network of main and service lines throughout the grounds. Five separate tie-ins to the regular city gas distribution system insure an uninterrupted service for the Centennial.

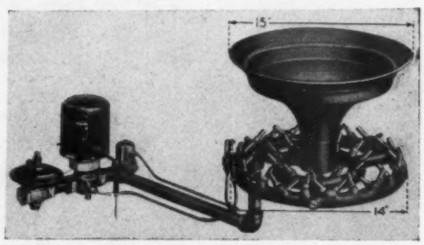
Many and varied are the uses of gas at the Exposition. Between 1,000 and 1,500 tons capacity of air cooling equipment has been installed to cool the air and reduce the humidity in various buildings at the Centennial. Gas kitchen installations at the Centennial range from the small units in model houses to a battery of nine ranges in use 15 hours a day to provide three daily meals for the 600 soldiers stationed at the Centennial. Natural gas is used in the laboratory kitchens of the flour mill exhibit, in three large kitchens built to handle the large volume of baking exhibits, and to operate a boiler furnishing the steam with which soy beans are processed in the Ford exhibit.

Three uniformed employees of the Dallas Gas Co., chosen because of their record with the company, will be stationed at the Centennial grounds with headquarters in the Utilities Building to give the best possible service to visiting gas consumers.

■ ■

Barber Gas Burner Announces New Round Burner Models

THE Barber Gas Burner Co. of Cleveland has just placed on the market two new conversion burner models for use in round furnaces or boilers having grates up to and including 20 inches in diameter. Among the improvements embodied in these



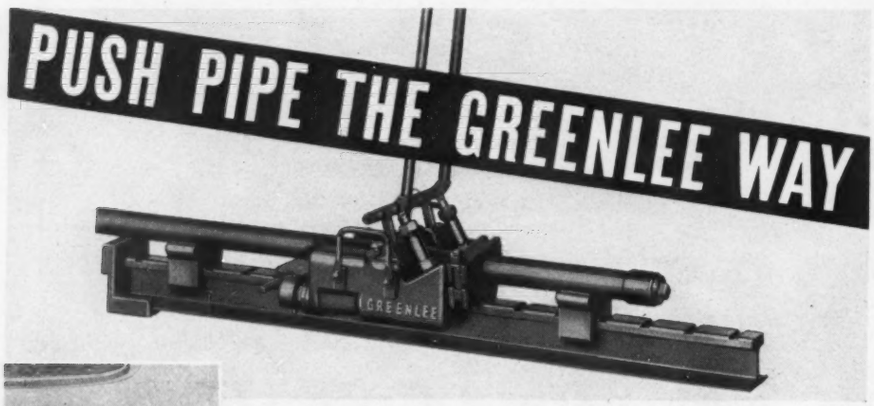
new designs are higher heating efficiency and greater ease of installation. Deflection of heat to the sidewalls is accomplished by a semi-steel deflector with deflector ring, which produces a scrubbing action of the flame on the sidewalls, making for maximum efficiency as well as economy. These burners require no refractory elements, thereby saving both installation time and replacement.

The assembly shown above (No. X-44-B) includes the Barber burner unit (No. X-44), with all necessary equipment for full automatic control. These new burners are also furnished for manual control.

■ ■

L. W. Cole, Community Natural Superintendent, Dies

Louis W. Cole, 43, superintendent of the eastern division of the Community Natural Gas Co., in Corsicana, Texas, died suddenly from a heart attack while driving his car September 3. Mr. Cole was formerly secretary and assistant treasurer of the Municipal Gas Co., which became a part of the Community Natural in August, 1935. His district included 91 cities and towns in North Central and East Texas.



Above is the Greenlee Hydraulic Pusher set up for pushing pipe under a paved street. One man, standing in a comfortable position, can exert a pressure of 40,000 pounds on the pipe clamp.

Saves Time and Money

If you are using a pipe pusher that requires several men to operate it, you can save considerable time and money by putting a Greenlee Hydraulic Pusher in service. And if you are making underground installations by trenching, you can save still more. No longer is it necessary to tear up lawns and pavement or to do extensive trenching, back-filling, etc.

With the Greenlee, it is only necessary to make a trench long enough to accommodate the pusher with a section of pipe, and one man can send it where it is wanted, simply by pumping the handles. Eight speeds are provided for varying soil conditions, and a push of from 4 to 7 feet can be made, depending on the length of base used, without changing the pipe clamp.

Investigate this improved method of pushing pipe for gas or any other purpose. Complete information will be sent, gladly.

GREENLEE TOOL CO., 1700 Columbia Ave., ROCKFORD, ILL.

GREENLEE TOOL CO., 1700 Columbia Ave., Rockford, Ill.
Please send complete details on the Greenlee Hydraulic Pipe Pusher.

Company .....

Address .....

City..... State.....

By..... G10-36

Modern Is As Modern Does

(Continued from Page 9)

Because of the many claims that are being made as to the right to use the word "modern" in this day and time, it seems appropriate for us to be reminded that after all, the public will decide the issue as to which service is superior, and, therefore, most entitled to be called "truly modern," on the basis of the one that does the best job. The most hopeful sign at present is that the gas industry seems to have become fully aroused to a realization of the fact that if it is to hold its position in public esteem, it must be prepared to give better service at less cost than its competitors.

■ ■

Clock-Controlled Range Drive Sponsored by L. A. Companies

THE three Los Angeles gas companies, the Los Angeles Gas and Electric Corp., the Southern Counties Gas Co., and the Southern California Gas Co., are cooperatively sponsoring a "Clock-controlled Range Campaign," offering free to each purchaser of a clock-controlled range an electric clock valued at $30.00 and up. The campaign, which was inaugurated on September 21, will continue until November 25.

Under the rules of the campaign, the customer must buy a range valued at a minimum of $139.50, but with the deduction of $30.00 for the clock and a 10 per cent trade-in allowance offered on old ranges, the net minimum cost to the customer is $98.55. Ranges are sold at $5.00 down with a minimum monthly payment of $5.00 and 21 months to pay. During a similar previous campaign over 14,000 ranges were sold in an area served by 700,000 meters, and company officials are expecting the current effort to pass substantially this former mark.

■ ■

Fisher Names General Meters Chicago Representative

THE Fisher Governor Co. announces the appointment of the General Meters & Controls Co., formerly known as the General Instruments & Controls Co., as its direct factory representative in Chicago with headquarters at 205 West Wacker Drive.

Personnel of the representing company will include E. A. Rhodes, James A. Riggs, and A. J. Foley, who have during the past several years been actively engaged in the engineering, sales and service of Fisher controls while connected with the Measurement and Control Division of Bell & Gossett Company, former representative of the company. The office will be under the direction of Richard P. Sunderland.

■ ■

Employees Credit Union

The Spokane Gas & Fuel Co., Employees' Credit Union with 78 members enrolled has just completed two years of successful operation. Assets amount to $2,000, and are available for loans to members at a nominal rate of interest. E. F. Clay is treasurer of this non-profit employees' association, which operates under the State of Washington Credit Union Law.

TROUBLE-FREE DITCHING With the BARBER-GREENE PIPE LINE SPECIAL

The Barber-Greene Pipeline Special Ditcher has too many advantages to overlook. The Buckets are Self-cleaning. The milling action digging gives the maximum speed in easy going, and the ability to mill through the hardest material. The two transmissions combine to give any desired speed, thus assuring the maximum output for any given conditions. The adjustable conveyor places the spoil bank on either side, and at the desired distance from the trench.

The Patented Barber-Greene Vertical Boom is particularly valuable for uncovering old pipe lines. The boom is hung close to the chassis, thus minimizing the cutting depth change caused by surface irregularities. The B-G Automatic Overload Release is invaluable in this uncovering operation, as it automatically slips when the pipe is hit by the buckets, thus protecting the pipe as well as the Ditcher. The Overload Release automatically resets itself. The elimination of this hazard lets the operator dig as close to the pipe as possible. Full crawler mounting makes it easier to keep the ditcher in line when digging, gives better maneuvering when traveling.

The economy, diggability, and stamina of the Barber-Greene deserve your investigation.

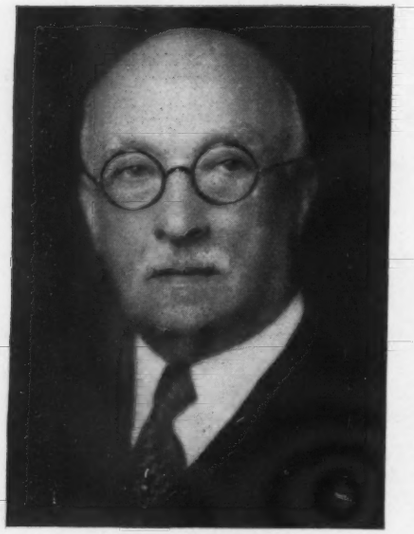
Phone, write, or wire. There is no obligation. Barber-Greene Company, 715 West Park Avenue, Aurora, Illinois. Representatives in principal cities.

STANDARDIZED MATERIAL

BARBER GREENE

HANDLING MACHINES

36-28



JOHN GRIBBEL

John Gribbel, Former American Meter President, Passes

JOHN GRIBBEL, banker, manufacturer, and civic leader, who was for 53 years prominently identified with the gas industry, died at his summer home "Weatherend" at Camden, Maine, August 26.

Mr. Gribbel, who was 78, had given up the post of president of American Meter Co. last May, to become chairman of the board. Last January he also retired as president of the Tampa Gas Co., a position held since 1911, to become chairman of the board.

Born March 29, 1858, in Hudson City, now a part of Jersey City, N.J., Mr. Gribbel was educated at the College of the City of New York. Following an early experience in banking, he entered the firm of Harris Griffin and Co., gas meter manufacturers in 1883, and soon became the directing head. Later he entered the succeeding firm, John J. Griffin & Co., and in 1892, when Mr. Griffin died, Mr. Gribbel bought out his interests and continued as the head of the business, which later combined with other units, incorporating in 1895 as American Meter Co.

At the time of his death, Mr. Gribbel was a director of nearly a score of companies, mostly in Philadelphia and New York. Among his many varied activities during his life, he was president of the Philadelphia Union League (1904-7); a trustee of Wesleyan University, which honored him with a degree; president of the Pennsylvania Historical Society, and member of the Board of Directors of the Philadelphia Rapid Transit Company.

■ ■

Franchise Granted Arizona Co.

At a special election held September 12, Natural Gas Co. of Arizona was granted a franchise to serve Florence, Arizona, with natural gas. Gas will be available for use in the city by the last of this month, according to M. A. Moody, manager of the company.

Spencer Thermostat Appoints Naylor Cleveland Manager

N. A. Naylor, until recently Eastern sales manager of General Controls Co., has been appointed by the Spencer Thermostat Co., of Attleboro, Mass., to take charge of its new branch office in Cleveland, Ohio. Mr. Naylor, formerly of San Francisco, is a graduate engineer of the University of California, and has spent most of his time in the heating and automatic temperature control field. The Cleveland office will furnish direct engineering and sales service pertaining to the installation of Spencer controls in the heating, ventilating, and air conditioning fields.

N. A. NAYLOR

■ ■

Meter Man Meets Meat-eater; Meat-eater Misses Meal

One advantage that Daniel had over Wilbur Jones of the Dallas Gas Co. when he entered the lion's den was that he didn't have to read a gas meter.

While making his rounds a month or so ago, Jones walked into the back yard of a house near the Texas Centennial Exposition. He read the meter, turned to leave, found himself staring into the startled eyes of two fair-sized African lions romping freely in the high-fenced back yard.

Three blocks and several seconds later Jones came to a stop, decided to go back and investigate. The lions, he was informed, were more or less tame, had been brought to Dallas to take part in the Centennial program.

■ ■

File Papers in Test Case of Gas Waste Law

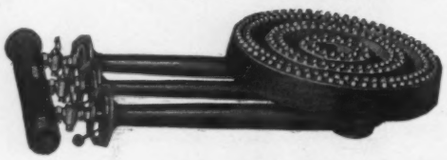
As the first penalty case under the new gas waste law, the Texas State Railroad Commission is seeking penalties totaling $126,000 from the F. C. Henderson Co., Inc., Panhandle gas operators, in a suit filed September 11 in the 98th district court, Austin, Texas, according to Ernest O. Thompson, chairman of the commission. The company is accused of producing more than 25 per cent of the potential daily capacity of its gas wells in violation of the law.

■ ■

Oklahoma Natural Voted Franchise

Oklahoma Natural Gas Co. has been voted a franchise to supply gas in Tulsa for domestic and industrial consumption for a 25-year period, according to an announcement by Frank B. Long, vice-president of the company. The company's previous franchise expired in 1931. The company will return some $40,000 to the city annually in franchise taxes.

JOHNSON No. 60 BCE
Triple Atmospheric Ring Burners



Three powerful, efficient open flame burners in one compact unit. May be used in single, double or triple units. Burners individually controlled. Adaptable to a wide variety of shop and factory uses. Jhonson Venturi Mixer and Tube and Patented Direct Jet Regulator assure perfect combustion, intense heat, efficient and economical operation. Full details on request.

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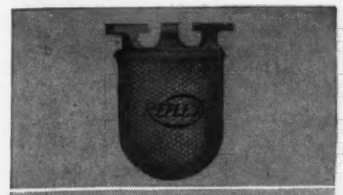
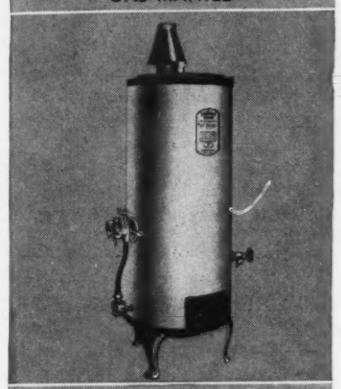
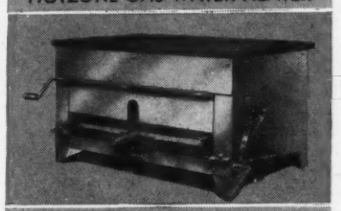


GAS MANTLE



HOTZONE GAS WATER HEATER



HOTZONE BROILER-GRIDDLE

HOTZONE PRODUCTS
EACH A LEADER

HOTZONE Gas Water Heater—the perfect automatic storage heater to combat competitive fuel appliances and win and hold consumers to gas.

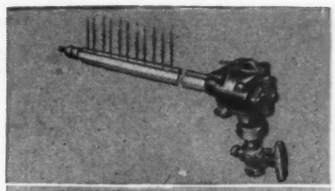
HOTZONE Gas Furnace Conversion Burner—utilizes a luminous flame burner, provides instant heat. No refractories. Absolutely silent in operation. Easily installed.

HOTZONE Broiler Griddle—For broiling, griddle work and roasting. Its uniform, penetrating infra-red radiant heat gives quicker and better results with less gas consumption.

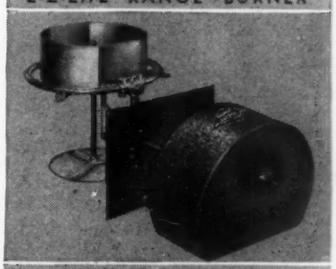
E-Z-Lite Range Burner (to convert any kitchen range into a heating unit for winter). Radiant and Kitchen Space Heater.

Behind all these products stands Welsbach's well-earned reputation for reliable appliances produced with the technique which only a half-century old experience can provide.

Welsbach Company
Gloucester City, N. J.
Branches in Chicago and San Francisco
Since 1887, Pioneers in the Manufacture of Gas Burning Appliances



E-Z-LITE RANGE BURNER



HOTZONE FURNACE BURNER

WRITE TODAY
FOR CATALOGS PRICES AND DETAILS ABOUT WELSBACH PRODUCTS

Don't let this be your fault

CLEAN gas from Blaw-Knox Gas Cleaners materially reduces service complaints. Concentrate your cleaning costs at one point and use the cleaner which thoroughly cleans at the lowest cost. Blaw-Knox Gas Cleaners at City Gate, Town Border or large District Regulator Station will do this.

The Washing Oil Cost is Very Low!!!

One company found .00174 cents per M removed nearly three tons of dust. Another found .0171 cents per M and removed many tons of dust.

Pilot lights are sensitive—Insure their better operation and thus insure better public relations with

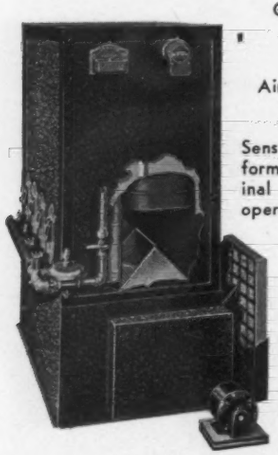
BLAW-KNOX GAS CLEANERS

Complete details on request without obligation—just write

BLAW-KNOX COMPANY
2033 Farmers Bank Building Pittsburgh, Pa.

NEW LOW COST

FRASER



Gas Furnace and Winter Air Conditioning System

Sensational in performance, low original cost and low operating cost.

Write for details today.

Manufactured by

Fraser Furnace Company

Stockton, Calif.

Distributed by

H. R. Basford Company

San Francisco **Los Angeles**

Coated and Uncoated

The front of this tank is coated with NO-OX-ID Aluminum Protective Coating. The back is uncoated. This photograph was taken to show both surfaces.

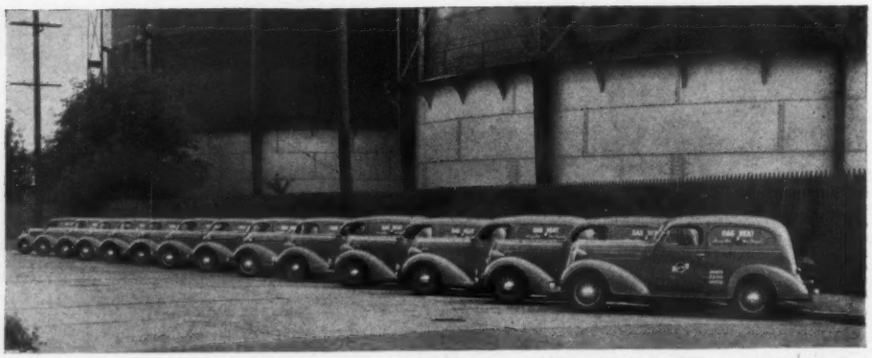
DEARBORN CHEMICAL COMPANY

Los Angeles: 807 Mateo Street Phone TRinity 3385

San Francisco: 421 Bryant Street Phone SUtter 8688

One of the reasons for going to Atlantic City, October 25-30 is to see the exhibition and learn why gas companies are using

NO-OX-ID IRON-RUST TRADE MARK The Original Rust Preventive



SEATTLE GAS CO. has placed in service 15 new automobiles, shown above. On one side of each new unit is pictured a man reclining in an easy chair, and the phrase "Gas Heat—Always Best—Now Cheapest". On the other side of the cars are the words, "Foods Taste Better Cooked with Gas", illustrated by a large and done-to-a-turn beefsteak.

Plans Formed to Celebrate Patent System Centennial

A nation-wide celebration of the founding, in 1836, of the present American Patent System will be held on November 23, 1936, in the auditorium of the National Academy of Science building, National Research Council, Washington, D.C.

Dr. Charles F. Kettering, President of the General Motors Research Corp., made this announcement in accepting an invitation of Secretary of Commerce, Hon. Daniel C. Roper, to serve as chairman of the National Committee to celebrate the event.

The celebration will have the sponsorship of the National Committee, whose membership includes representatives of the Department of Commerce, the U. S. Patent Office, the national association of patent attorneys, science museums and the industries of the nation.

■ ■

J. J. Winn, Jr., is Commercial Manager at Portland

JOHN J. WINN JR., in charge of sales promotion for the Hartford Gas Co., has been appointed commercial manager of Portland Gas & Coke Co., Portland, Ore., and will report for his new duties in the latter part of this month, according to Paul B. McKee, president of the company. Mr. Winn will take the place of B. H. Parkinson, who has resigned to accept a position with the North Coast Electric Co.

A graduate of Massachusetts Institute of Technology, Mr. Winn has had wide experience in the engineering and sales divisions of the gas business, much of his work having been devoted to the development of house heating and industrial business.

■ ■

Southern Counties Builds Two Branch Offices

TWO new branch office buildings for the Southern Counties Gas Co. are scheduled for completion within the next three months, according to an announcement by F. S. Wade, president of the company.

A one-story concrete building, at Newport Beach, Calif., of modern architecture and with large display windows on two sides, will cost approximately $15,000 complete. Quietness in the offices and display room is assured by a sound deadening material which has been applied to the ceilings. One of the features of the spacious appliance display room is a parquet oak floor.

The second building, shortly to be occupied by the company's staff at Wilmington, Calif., is of reinforced concrete construction. The entire half of the building will be given over to an appliance display room. The structure is expected to cost approximately $13,000 when completed.

■ ■

Three Los Angeles Companies Sponsor Gas Industry Day

Under the auspices of the Natural Gas Bureau the employees of the Los Angeles Gas and Electric Corp., the Southern California Gas Co., and the Southern Counties Gas Co. sponsored a Gas Industry Day, September 18, at the California House and Garden Exposition on Wilshire Boulevard, Los Angeles. Featured at the exposition were five all gas model homes equipped with the latest in automatic gas househeating units, clock-controlled ranges, automatic storage water heaters, and Electrolux refrigerators. Approximately 1500 employees, friends, and members of the gas appliance industry attended. Entertainment was under the direction of Warren W. King of Los Angeles Gas and Electric Corp. Clyde H. Potter of Southern Counties Gas Co. acted as master of ceremonies.

■ ■

Stearns Made Barber-Greene Sales Manager

Earl D. Stearns has been appointed sales manager of the Barber-Greene Co., Aurora, Ill., manufacturers of conveying and digging equipment.

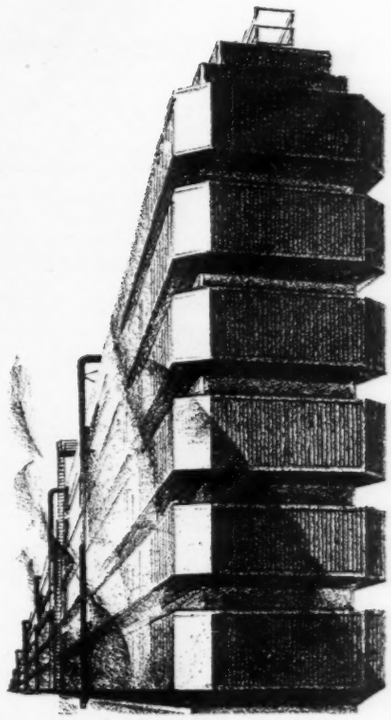
Mr. Stearns is a nationally recognized conveying engineer, his past experience including 12 years with Stephens-Adamson, serving eight years as manager of their Pittsburgh and New York offices. He was later, successively: vice president and sales manager of H. K. Ferguson Co., Cleveland; president of Stearns Conveyor Co., Cleveland; vice president and sales manager of Fairfield Engineering Co., Marion, Ohio; and Western sales manager of Robins Conveying Belt Co., New York City. In his association with Barber-Greene since 1933 he has been in charge of engineering sales.

. . . . IMAGINE A COOLING TOWER 2 MILES LONG

During the first eight months of 1936 over 2 miles of cooling tower has been constructed by the Fluor organization for the oil and gas industry. Installed in sectional units of varying lengths, Fluor Aerator Type Cooling Towers are rendering efficient service in nearly every section of the nation.

The noteworthy fabrication of 2 miles of cooling tower in eight months was not accomplished either through super-selling or unprecedented demand—it has been the direct result of an established preference for Fluor design, engineering, workmanship and proven operating principles.

Write today for your copy of Bulletin T-236 giving full details on Fluor Aerator Type Cooling Towers.



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BE SURE WITH FLUOR

FLUOR AERATOR TYPE COOLING TOWERS

A Momentous Day for America

The day of a national election is always a great day in the United States. This year, 1936, it is perhaps even more important than it has been in the past. Big issues will be decided by the election of Nov. 3rd, 1936.

It has been said that no election since 1860 has had so great a bearing on the future course of this country, as will the election of 1936.

In the national election of 1932 there were 43% of those who had the right to vote who did not take the trouble to go to the polls.

The responsibility for the result of the election this year rests right on the shoulders of every individual man and woman who has the right to vote—and if YOU are entitled to vote, be sure that you let no sacrifice of time or inconvenience keep you from registering and voting Nov. 3rd, 1936.

Vote!

Natural Gas Comes to Illinois Area

ACCORDING to schedule Moline, East Moline, Rock Island, and Silvis, Ill., will be served with straight natural gas by the 15th of October. Gas will be supplied from the Natural Gas Pipeline Co. of America system. The area to be served comprises approximately 20,000 meters and to connect the distribution systems of these towns, The Peoples' Power Co., Rock Island, constructed some 6 miles of 6- and 8-inch line, according to R. B. MacDonald, president and manager.

A large crew of workmen was engaged to carry the line across the Rock River, southeast of Moline, where it was necessary to do considerable blasting and dredging. Two 8-inch lines are being run across the river, one to be used as a reserve in case of emergency. A 6-inch line will carry the gas from the north bank of the river to Coaltown road and west on Twenty-ninth street to a governor station to be constructed at a cost of $2,000. A branch line will be constructed to serve East Moline and Silvis. The Peoples Power Co. to date has served all the towns from a manufacturing plant located in Rock Island.

■ ■

Additional Water Heater and Range Requirements

TWO booklets of proposed standards covering gas appliances and gas appliance accessories have been distributed to members for criticism and consideration by the American Gas Association Testing Laboratories. The first of these offers tentative requirements for attachable gas water heating units without water-carrying parts. The second presents suggested revisions to the domestic range requirements in force since January 1, 1936.

Essentially, the suggested Listing Requirements for attachable gas water heating units without water-carrying parts are identical with the standards now used for the approval of complete storage gas water heaters. Final adoption will be made by the A.G.A. Approval Requirements Committee at its spring, 1937 meeting.

The completed attachable water heating unit standards will permit, for the first time, A.G.A. certification of equipment offered to a lower income market for converting range boilers and non-automatic water heating equipment to modern, insulated and fully automatic service.

The completed range revisions will permit the publication of the eighth edition of the gas appliance standards, which will go into effect January 1, 1938.

■ ■

Wm. Hogenson, Jr., Named to Republic Steel Post

William Hogenson, Jr., has been named special representative on Toncan Iron enameling stock, according to an announcement by F. H. Ramage, manager of Sales Promotion, Republic Steel Corp. His work will be in conjunction with that department under the new Product Development Division.

Mr. Hogenson comes to Republic with a background of technical and business training gained at the Universities of Michigan and Chicago, and a close association with the enameling industry through his most recent connection, Chicago Vitreous Enamel Product Co.

HYDRAUGER

MODERN HORIZONTAL BORING MACHINE

For Underground Installation of Pipe and Conduits. Avoids damage to costly pavements and saves time. Send for Bulletin.

HYDRAUGER CORPORATION, Ltd.
116 New Montgomery St.
San Francisco, Calif.

REFRACTORIES

GENERAL CERAMICS COMPANY
• REFRACTORIES •

For Conversion Burners, Circulating Heaters, etc.

Because they are uniformly accurate, strong, and dependable in every way, General Ceramics Refractories are used by most of the leading manufacturers of gas heating appliances. • Our engineers will gladly cooperate with you.

General Ceramics Company, 30 Rockefeller Plaza, New York

Western Gas
is compressed by
COOPER-BESSEMERS
50 to 1600 horsepower

THE COOPER-BESSEMER CORPORATION
640 East 61st St. Los Angeles, Calif.
PLANTS: Mt. Vernon, Ohio — Grove City, Pa.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933

Of GAS, published monthly, at Los Angeles, California, for October, 1936.

State of California, County of Los Angeles—ss.

Before me, a notary public in and for the State and county aforesaid, personally appeared Jay Jenkins, who, having been duly sworn according to law, deposes and says that he is the Publisher of GAS, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, Jay Jenkins, Los Angeles, California.

Editor, George H. Finley, Los Angeles, California.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

Western Business Papers, Inc., Los Angeles, California.

Jay E. Jenkins, Los Angeles, California.
George H. Finley, Los Angeles, California.
James E. Jenkins, Los Angeles, California.
Craig Espy, Chicago, Illinois.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)

None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

JAY JENKINS,
(Signature of Publisher.)

Sworn to and subscribed before me this 21st day of September, 1936.

(Seal) Dolores Bingham.

(My commission expires Sept. 13, 1940.)

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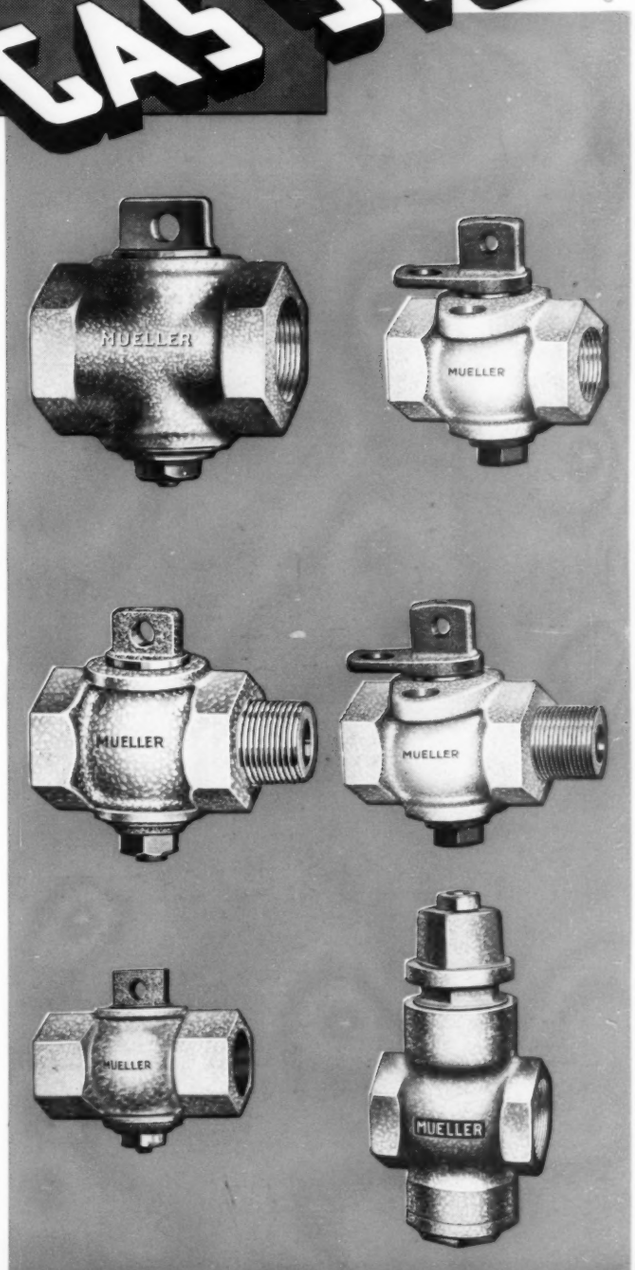
IRON BODY GAS STOPS



You'll find that Mueller furnishes practically every style of Iron Body Gas Stops to meet the requirements of the industry There are many sizes and types to choose from that make it possible to meet any special installation or condition that requires a good strong dependable Stop.

This complete line of Gas Stops has the traditional MUELLER quality built into each and every one. The bodies are made from the best grade of gray iron, produced in our own foundry, and are scientifically designed to give them strength where it is needed to withstand rough usage. The plugs, nuts, and washers are made of a very high tensile strength brass, the plugs having an enlarged stem and fine thread which provides strength and permits accurate adjustment. You will find that Mueller Stops have large gas ways and are provided with a generous lap, the plugs being lapped into each individual body by expert workmen with special Mueller Machines and each stop is carefully tested with air while submerged in liquid.

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